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More Comments from the Mayors

In place of the usual Editorial Comment, it is a pleasure to devote the opening pages of this issue to letters which we have received from the Mayors of seventeen important cities. These comments are, almost without exception, very reassuring as to the outlook for municipal improvements during the coming months. Considered with the statements from twenty-one other cities published in our September number, they indicate a determination on the part of municipal executives to add as little as may be to the unsettled business conditions arising from the European war. Four possible methods of financing public work were suggested editorially in the last issue.

Philadelphia, Pa.

Notwithstanding the European war, with its consequent diversion of public energy from normal activities, I believe the American municipalities should show no abatement of vigor in the erection of public buildings, in providing facilities for traffic and commerce, in the construction of subways and the modern improvements attendant upon the growth of our cities, conserving the health, convenience, happiness and progress of our citizens.

To the best of our ability this administration will place under contract, and press toward speedy completion, as many public enterprises in Philadelphia as possible, and I shall urge the floating of new municipal loans in necessary amounts for the undertaking of important new projects.

RUDOLPH BLANKENBURG, Mayor.

St. Paul, Minn.

It is a pleasure for me to add my word of endorsement to your programme for a boom in construction work throughout this country during the coming fall and winter.

I think your brief editorial covers the ground completely. Your slogan, "Let the armies of construction go forward!" is the word most needed in our country at this time. I have always been a firm believer in carrying on every possible improvement in our cities, regardless of the general financial condition. I believe that it is very poor economy to hold up construction work during times when financial conditions are not encouraging —in fact, this is the very time when improvements should be carried on, for the reason that there is greater necessity than ever for furnishing employment to our people.

I am glad to say that our city contemplates no curtailment of public work during the coming year. I am with you entirely in your effort to maintain the record of the United States along the lines of public improvement in keeping as many of our people at work as can possibly be done under the circumstances. If the business men of the United States will keep themselves free of any feeling of public uncertainty during the next few months, there is no question in my mind that the coming year will mean more to the United States than any year in the past decade. Keep up the good work.

WINN POWERS, Mayor.

Los Angeles, Cal.

The city of Los Angeles is going forward with all public work without any interruption, and preparations are being made to continue actively construction work, such as harbor improvements and the construction of a municipal electric power plant, in which the city has already expended $3,500,000. When completed this power plant will represent an outlay of about twelve or fifteen millions of dollars, and will develop eighty or a hundred thousand horse-power of electric energy, sufficient to furnish the city with light and power for many years to come.

We do not apprehend that the foreign war disturbance will materially retard the progress of the work. It is the intention of the city to prosecute energetically all public work at a time like this when labor is plentiful and employment is necessary.

F. J. WHIFFEN, Acting Mayor.

Dayton, Ohio

Every effort will be made in the city of Dayton to continue construction work throughout the fall and winter, the weather permitting.

In addition, an effort will be made to furnish as many laborers employment as possible. We realize that a great many will be out of work during this winter, and some special arrangement will be made so that some benefit may be received by the greatest number at all possible.

J. B. HARSHMAN, Clerk of the Commission.

South Bend, Ind.

Concerning the statement on the front cover of the August issue, will say that I am in favor of going right ahead with construction work. We have just within the last week let the contract for a number of sewers, and expect to let the contract for more in a short time.

I am personally interested in a large office building which we are just starting to build and which will go right ahead.

F. W. KELLER, Mayor.

Des Moines, Ia.

The city of Des Moines is going right ahead with all manner of public improvements. We are doing paving, sewering and other street work, river improvements and the building of a fine viaduct crossing the railroads and the Raccoon River.

JAMES R. HANNA, Mayor.

Davenport, Ia.

It seems to me that on the question of municipal work there can be but one view at the present time, and that is that the municipalities should endeavor to do their part to relieve the depression by engaging in such municipal improvements as they can without going beyond their means.

ALFRED C. MUELLER, Mayor.

San Francisco, Cal.

San Francisco does not contemplate the curtailment of any of its public works during the next year because of any conditions resulting from the deplorable conflict in Europe.

During the last few years San Francisco has been undergoing the greatest period of reconstruction, public as well as private, in its history. The vigor of this work will not be abated. San Francisco will continue the construction of its new City Hall, which when completed next year will have cost $3,500,000, and will be the chief structure in a civic center for which $8,800,000 voted by the people will have been expended.

Another building in this civic center which will be ready on the date of the opening of the Panama-Pacific International Exposition will be a great auditorium, costing $1,000,000, in which hundreds of conventions will be held for the accommodation of thousands of visitors to our exposition in 1915.

Work will continue without a halt upon the immediate extension of the Municipal Street Railway, for which $3,500,000 has been voted by the people. These extensions will practically all be completed in time to serve the traffic needs of the city during the rush period of the Exposition.

San Francisco is rapidly completing the first units of a City and County Hospital, the total cost of which will be approximately $2,500,000. Of this amount about $1,000,000 remains to be expended upon additional wings, the construction of which will shortly be commenced. The main structure is expected to be ready for occupancy by January 1, 1915.

San Francisco will continue its development work in the Hetch Hetchy region in accordance with the grant of Congress enabling the city to go to the High Sierras for a municipal water supply. In addition to that, negotiations are now pending for the purchase by the city of the properties of the Spring Valley Water Company.

In addition to this, work in other departments will be carried forward with the usual vigor, not the least of which will be the expenditure of $1,150,000 for street reconstruction and repairs during the fiscal year ending June 30, 1915.

JAMES ROLPH, JR., Mayor.

Salt Lake City, Utah

The accidents of foreign relations have not changed nor altered our attitude toward new construction work during the coming fall and winter, and it is our intention to go ahead with new construction work of all kinds with unabated vigor.

It has been our practice, on account of winter, to conclude our paving and water-main extension work by November 15, and this will be done this year.

We have recently advertised for the installation of a very large sewer system, upon which some work has been done. This work will be continued in the spring as soon as the weather permits.

During the past two and a half years Salt Lake City has installed more public improvements than in any like period of its history, and the work planned will last for some time to come. While our community is comparatively small, we have been able during times of depression to furnish our own people, particularly men with families, sufficient work to enable them to live comfortably. While our activities are more than normal at the present time, I would not wish to be considered as inviting any assistance in the labor market from the outside, as such a contingency would result in hardship not only for those who came but also for those who are now well provided for.

SAMUEL C. PARK, Mayor.

Indianapolis, Ind.

No progressive city should permit its work of public improvements to stop at this time. The unsettled business condition of the country, due to the European war, will result in throwing many men out of employment at least for a few months until products of this country begin to move to supply the demand of European countries. Public improvements will furnish work for many laborers who otherwise could not get work.

On the other hand there is no reason why the work of public improvement in cities should not go forward, because the credit of our cities is in no way impaired by this European war. If public improvements should be suspended, it would require much time and reorganization to get them under way again.

For these reasons I believe that all work for the betterment of our cities should be continued, and this will be the policy of the administration in Indianapolis.

J. E. Bell, Mayor.

Akron, Ohio

The statement on the front cover of your August issue is excellent, but you seem to have overlooked one angle of the situation.

No municipality in Ohio—and I presume other states have similar laws—can go forward with improvements or enter into any contracts until means have been provided to pay the cost. It is not possible to provide means for other than ordinary expense by direct tax levy, and the only way provided is by issuing bonds. At the present time there is no market for bonds, and unless there is a change in the situation, improvements now under way in this city will have to be stopped before completion.

If you could supplement your statement with an argument which would influence investors to buy municipal bonds, it would enable municipalities to carry out your idea, and perhaps many of them would do it.

Frank W. Rockwell, Mayor.

Terre Haute, Ind.

The City of Terre Haute is paying absolutely no attention to the European war. We are proceeding with our street improvements the same as if the war didn't exist. More constructive work is going on at the present time than has been done in the past 20 years. We are taking care of our obligations, and business conditions are better in the City of Terre Haute than they ever were before.

Donn M. Roberts, Mayor.

Seattle, Wash.

I know of no reason why any American city should halt at all in its progress because of the European trouble. As far as I am personally concerned—and I believe the City Council feels the same way—we shall continue the usual construction work as though nothing had happened.

This I think should be the policy of all our municipalities.

H. C. Gill, Mayor.

Albany, N. Y.

There is no disposition on the part of the city administration of Albany to halt any of the municipal improvements now under way for any cause; nor do we fear that any of our plans will have to be altered, because our bonds already have been marketed for public work to extend over a period of many months.

Joseph W. Stevens, Mayor.

Erie, Pa.

There is no let-up of the public work in the city of Erie at the present time. We are probably making more extensive improvements now than at any other time in the history of our city, and this work is being prosecuted with all possible dispatch. Owing to climatic conditions in Erie, it is not usual for outside work to continue beyond the time of freezing weather, and this is the only thing which will make us halt in our work during the coming winter season. I believe it is a good thing for all municipalities to do all the necessary public work that can be done at the present time, in order to provide as much employment as it is possible to give to the many thousands of men who are walking the streets of the cities of the United States looking for an opportunity to labor.

W. J. Stern, Mayor.

Nashville, Tenn.

The Board of Commissioners of the city of Nashville are not aware of any logical reason why the European war should in any manner interfere with the contemplated new construction work for the coming fall and winter.

We have started the construction of streets to cost approximately one million dollars, and we propose to prosecute this work, regardless of wars in Europe or elsewhere.

In my opinion the European war can only cause confusion in America by temporarily paralyzing trade between the United States and the various countries involved in the conflict. From our standpoint, however, this need have no effect on contemplated municipal improvements such as are being carried on in every American municipality.

H. E. Howse, Mayor.

Yonkers, N. Y.

It seems to me that the work of local improvement in our cities should not be checked by reason of the terrible conflict in Europe. Of course, there may be some temporary difficulty in financing some of the larger propositions that require the sale of bonds to a large amount. These may have to wait for an easier money market. Ordinary contracts, however, the funds for which can be secured from local sources, should rather be urged along so as to afford as much employment for as many people as is possible. Here in the city of Yonkers, with nearly a million dollars' worth of work under way, beside the ordinary departmental activities, we have let every single contract for which provision had been made by the Common Council.

James T. Lennon, Mayor.

SANTA MONICA POLYTECHNIC HIGH SCHOOL
On a hilltop overlooking the sea
Allison & Allison, Architects

How Can We Raise the Standard of School Architecture?

By Charles Henry Cheney
Architect

CAN we raise the standard of our school architecture? Can we find the means of reaching both the boards of trustees who are responsible for it and the architects whom they employ? That is the problem now occupying the minds of many who have noted with regret that the average school buildings throughout the United States are hardly up to the standard of progress and efficiency shown by our general educational system.

It is not so much that our school boards and architects do not try to design and build the best possible structures for housing the ever-increasing number of pupils. The school trustees of America, serving in general without pay, are probably more generous of their time and careful of their prerogatives than similar boards in any other country of the world. But the problem is for them to lay their hands readily on information as to what are the best types of school buildings to follow, where they are located, and how similar buildings adapted to local needs can best be designed. It is important, therefore, that some way be found of selecting the latest developments in school architecture, and of seeing that these buildings become known to the school trustees and architects who have need for them.

An attempt to solve this problem has recently been made by Edward Hyatt, State Superintendent of Public Instruction in California. He invited all the school superintendents, architects and school trustees of the state to send him plans, drawings and photographs of what they considered the most successful, up-to-date and efficient school buildings in their respective districts. He then invited a jury of five architects in good standing in the profession to select for publication by the state the best buildings shown among the four hundred or more reproductions which had been received. While the thirty-five or more buildings thus picked out do not include all the best buildings in California, they certainly form a standard which may well be followed throughout the state.

As the problem is practically the same in all the states of the Union, this report will undoubtedly be of great interest all

EDITOR'S NOTE.—The illustrations accompanying this article were loaned to THE AMERICAN CITY by the courtesy of the Superintendent of Public Instruction of California. They are from the recent bulletin entitled "School Architecture in California," copies of which may be had upon request to the State Superintendent of Public Instruction, Sacramento, Cal.

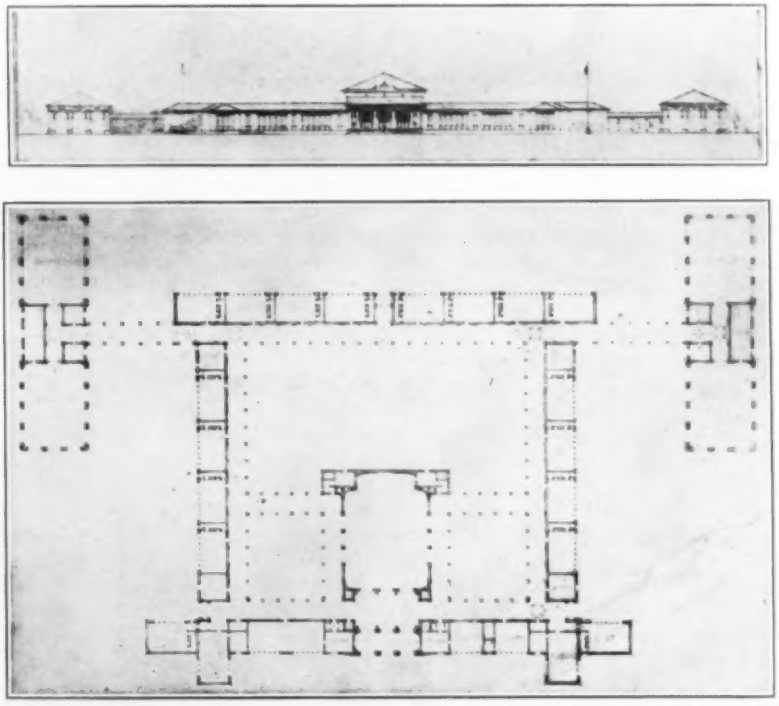
over the country. Copies have already been sent out by the state to boards of education and other school people in California, and the report has caused a great deal of discussion which is bound to draw attention to better school architecture. In fact, this experiment suggests the question as to whether it would not be a good thing to attempt a similar selection of the best school buildings of each type in all the states of the Union, having them picked out by a jury composed of well-known school architects throughout the United States.

City school buildings are a special problem, for the reason that nearly all American communities are hampered by small school sites. While a few of our municipalities are insisting upon from six to fifteen acres for each school building, with schools not more than one mile apart, most of the established cities, and particularly the larger ones, find it all they can do to get even a whole city block, on account of the tremendous cost of the land.

The size of the site is a matter undergoing a tremendous change for the better in the West at the present time. The great value of organized play, and the increasing interest in the opening of school buildings to the larger community for use after school hours, have led to the now generally accepted idea that every school should have ten or twelve acres of ground if possible. Although congested city conditions often make this impracticable, it is still significant to see municipalities as large as Los Angeles and Oakland purchasing such sites.

The New One-Story Multiple-Unit School Building

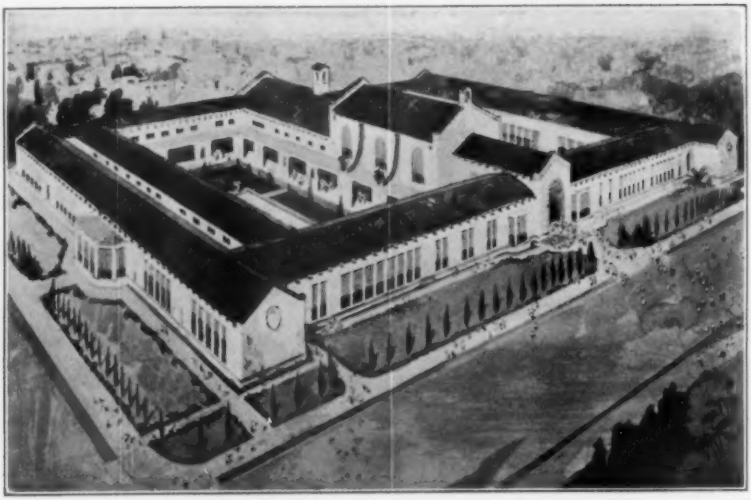
It is distinctly interesting to note how many communities are turning to the one-



ELEVATION AND PLAN OF THE LOCKWOOD SCHOOL, OAKLAND

An example of the unit plan. The school occupies a 17-acre site. Ten rooms have thus far been built. The building has a reinforced concrete frame with walls of terra-cotta blocks. Note the open cloister effect.

Lewis P. Hobart, Architect; J. J. Donovan, Supervising Architect



EMERSON SCHOOL, OAKLAND

One story, reinforced concrete, cement finish, trimmed with brick, red tile roof. The cloisters serve as playgrounds during wet weather, and give openness and freedom of circulation.

John Galen Howard, Architect; J. J. Donovan, Supervising Architect

story type of building wherever possible. As the sites grow more ample, there is no question but that school buildings all on one floor are greatly to be desired. For hygienic reasons the girl students at least should not be subjected to too frequent climbing of stairs. The added danger of panic in case of fire or earthquake has made the tendency all in the direction of one-story buildings.

A satisfactory new multiple-unit building has also the advantage that if only part of the classrooms are built at first, additional rooms can be added comfortably and conveniently without ruining the appearance of the building, until the maximum advisable under one principal—generally twenty-four classrooms—has been reached. The present movement for open air classrooms can also be easily handled by having the window side of the room entirely removable. This type of building is becoming very popular with school boards in the west, because they can add $5,000, the cost of each additional room, to their annual budget to take care of the normal increase in pupils without the necessity of an additional bond issue.

The great increase in light and air and safety from fire and panic in this one-story type easily offsets the slight additional cost over a two-story building. However, it will still be necessary to build two-story buildings in a great many cities, in order to leave a reasonable part of the school lot for play space.

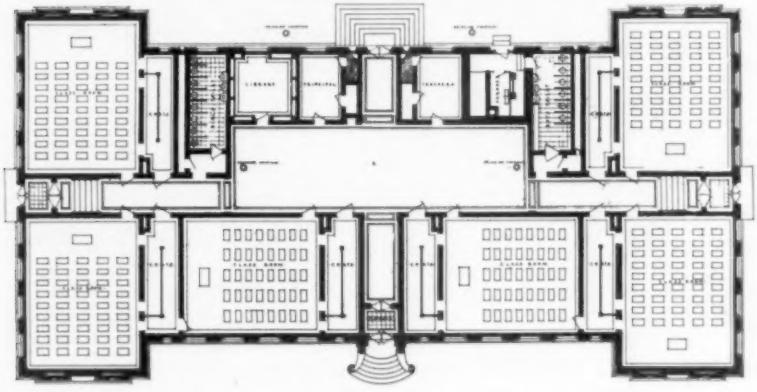
During the school year 1912-1913 there was set aside and expended in California for new buildings the sum of $7,372,215.18 This was distributed over kindergartens, elementary schools, high schools, and normal schools. Hence, the importance to the state of obtaining not alone the highest practical results, but also the best designs and architecture.

If so many buildings at such great cost are set up annually as an object lesson to all the younger generation, is it not absolutely essential that they should advance the highest and noblest ideas possible, that they should form a nucleus for the patriotic sentiments of their respective communities? Should they not help to attract the incoming population which western states in particular are so anxious to have?

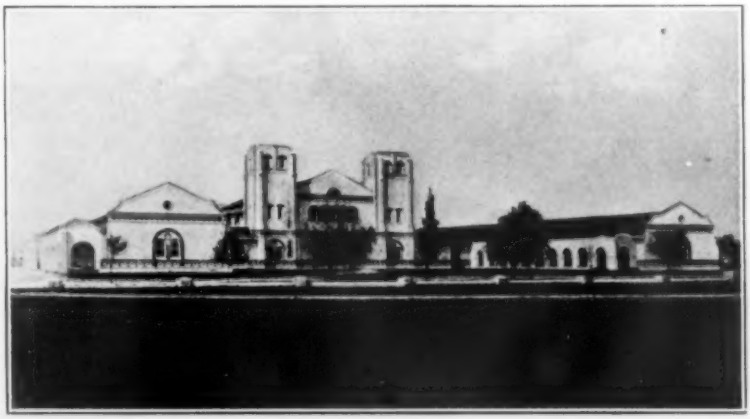
In 1912 Oakland, Cal., voted $2,000,000 for new buildings and sites, and the Board of Education was broad-minded enough to conduct a national inquiry into what are the requirements and what constitutes the

ARTESIA GRAMMAR SCHOOL, A ONE-STORY EXAMPLE IN BRICK

Withey & Davis, Architects



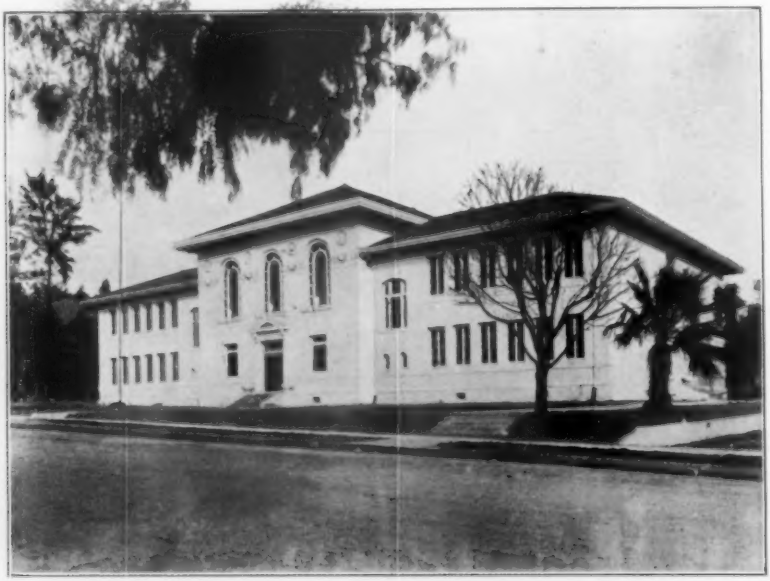
MAIN-FLOOR PLAN OF GRAMMAR SCHOOL AT ARTESIA



THE LINCOLN GRAMMAR SCHOOL AT MADERA, A BEAUTIFUL AND COMMODIOUS BUILDING

Ben McDougall, Architect

highest type of school building. The findings of this commission * are perhaps the most complete summary of the school building problem conducted in this country. Now that they have been put into practice and some fifteen new buildings completed, the splendid results should be an inspiration to school boards everywhere. The one-story type of building seems to have proved its worth.



WILD ROSE GRAMMAR SCHOOL AT MONROVIA. GOOD HANDLING OF A TWO-STORY BUILDING

Allison & Allison, Architects

Place Good Buildings Where They Can Be Seen

In any community the proper placing of a school building can add much to the beauty of the city. A particularly apt illustration of this is shown in the new Santa Monica High School, which has been placed on a hill behind the town in such a way as to dominate the whole city.

The placing of fine schools or other public buildings to block the end of a street receives much attention in other countries. America is just beginning to take cognizance of this idea, and where adopted it forms a distinct relief to the checkerboard plan with which our cities are generally afflicted.

Good architecture provides one of the strongest of favorable impressions that any municipality can make on its visitors, and if buildings are to be so placed as to call attention to the fact that the taxpayers' money is well spent, the prestige and civic pride of the city will be greatly enhanced. This is a matter that might be kept in mind by school boards in selecting future sites.

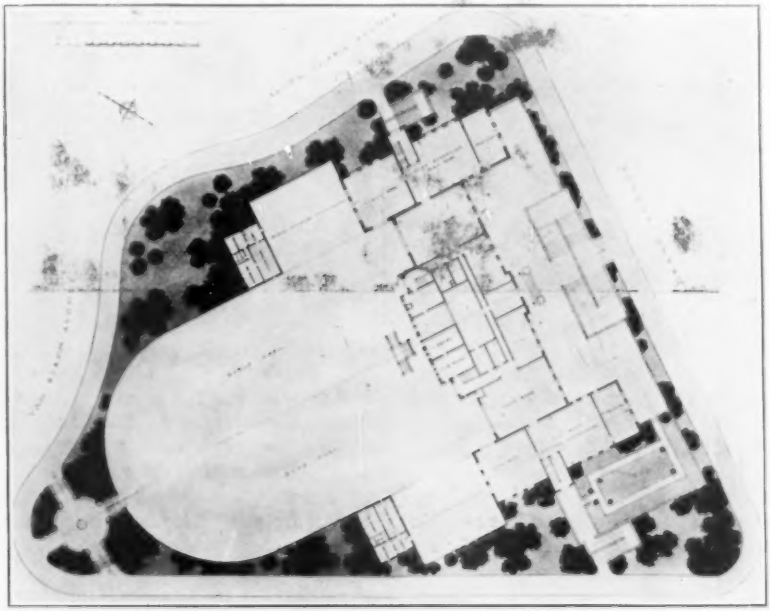
It is in no way necessary, however, that school buildings be made monuments of architecture. Most attempts in that direction have impaired the value of the buildings as schools. In fact, it is unfortunately true that the lighting and efficiency of many buildings in this country are completely ruined by such attempts at making an unwarranted and deceptive display.

Shall the State Pass on Drawings?

It is proposed in California that a state art commission be established to pass on

* For a complete summary of the findings see "Oakland School Building Inquiry," by C. H. Cheney, *American School Board Journal*, Milwaukee, March, 1913.

and check up the plans for all school buildings. Certainly no more thorough method could be found for raising the standard. Such a commission, composed of architects and representatives of the school system, serving without pay, as in the case of the municipal art commissions in New York City and elsewhere, could easily be added to the machinery of the state, with only the expense of a secretary and clerical help. A bill for such a commission has already been drafted at the request of the last legislature, to be presented at the next session. Is this not an idea worthy of consideration in all parts of the Union?



PLAN OF LAKEVIEW SCHOOL, OAKLAND
J. J. Donovan, Architect

School Architecture Requires Special Study

School architecture is a special problem. The practical requirements are many and diverse, and the solution of the planning problem alone requires an experienced and well-trained architect. While California in most parts of the state does not present the rigorous climatic conditions of the eastern states, the problems of school design are nevertheless very much the same throughout the country. Although from the practical standpoint planning has the preponderance of importance, the problem of obtaining an attractive and dignified looking building is of great consequence to every school board.

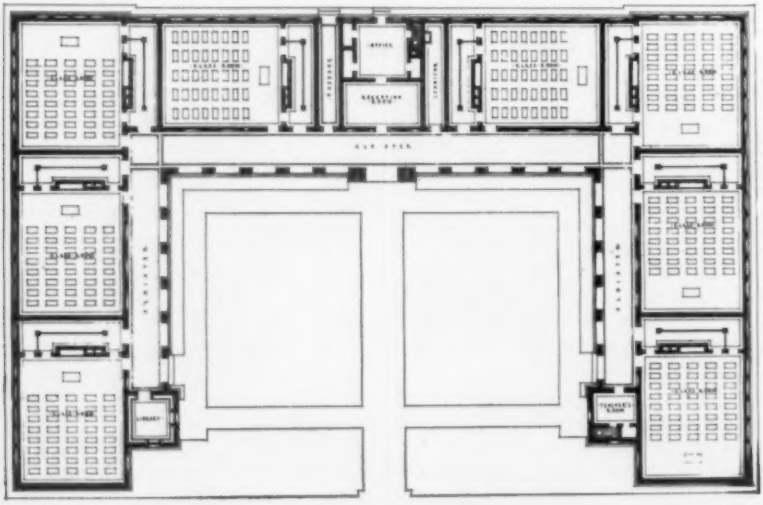
It requires more than a good carpenter or contractor to obtain either of these results. Yet it is unfortunately true that in the interior and country communities it is very difficult to obtain a well-trained architect to undertake the work. While it may also be true that local pride might favor a local design, such preference is very likely to be the undoing of school boards. The best trained and equipped architects can only be found in the larger centers of population.

Is it right for local boards to work for anything but the highest results in buildings which are to determine the future efficiency and health of the generation? Should they not have at their command the best sources of information possible and be cognizant of the latest development in school architecture? Should public money

SANTA PAULA GRAMMAR SCHOOL. EIGHT ROOMS ABOUT A SIMPLE COURT
Withey & Davis, Architects

be spent for anything but the finest buildings possible?

Good results in architecture are largely a matter of evolution, of study, with a knowledge of the previous forward steps in design. It is evident that if reproductions of the foremost examples of school building in these United States could be distributed to every school board trustee in the country, these boards could go on improving and making over until we had built up a school architecture founded upon the best that is in existence—in other words, create a standard.



PLAN OF GRAMMAR SCHOOL AT SANTA PAULA

Echoes from the Front

Some Results of the Struggle for Lower Rates, Better Service and Municipal Ownership of Street Railways

By Delos F. Wilcox
New York City

IN this country our "far-flung battle line" extends away beyond the paltry 150 miles of the Franco-German conflict, for it reaches across the continent from Boston to San Francisco, and its tortuous course touches cities as widely separated as Dallas and Duluth. Moreover, our battle line is formed, not for a few weeks' campaign or a few months' at the most, but for a hundred years' war. It is the battle line of an irrepressible conflict in our economic and political civilization. It is the war between the people who dwell in cities and the utilities which serve them.

Transportation, communication, water, light and power have come to be essentially and inescapably public functions. In the great urban centers that have sprung up within the past few decades, they are coming to be literally and logically matters of life or death to the community at large and to the individual members of it. It may be urged with some show of reason that these utilities, in their inception, were not public functions, and that therefore the policy which has prevailed for the most part in this country, of leaving them to be developed, owned and operated by private agencies for private profit, was not at the beginning wholly inconsistent with the logic of the facts. They were at first more or less experimental. They have since become the second nature of cities, and it can no longer be doubted that the controlling motive in their development and operation should be community welfare rather than private profit.

The Great Conflict of Interests

Now, the antagonism between the motive of private profit in the operation of public utilities and the motive of public service is as inevitable, as irrepressible, and as everlasting as any antagonism that ever existed between rival nations. We must not blink the facts. There is no advantage in crying "Peace, peace, when there is no peace." The fundamental conflict of interest between the private owners of a public utility and the city served by it cannot be permanently overcome by a sliding scale agreement as to rates, or by giving the city representation on the company's board of directors. All these peace agreements are mere truces on the battle line. There can be no peace worthy of the name until the operation of public utilities has been made subordinate to the public interest, to the same extent that any other governmental function is so subordinate.

It is not strange, therefore, that under existing circumstances the relations between cities and public utilities in the United States should be one of almost constant turmoil and strife. At one time we hear of a tremendous struggle in San Francisco or Seattle. At another time the strife breaks out in New York or Boston. And all along the line, in Philadelphia, Cleveland, Detroit, Chicago, Kansas City, Des Moines and Denver, stubborn engagements are fought. Fundamentally, the cities are striving to secure the best service at the lowest rates. Fundamentally, the companies are striving to secure the highest returns for the least service. Here is the crux of the public utility problem so long as public utilities continue to be owned and operated by private corporations. The good service that the cities desire is composed of many elements. It includes promptness, comfort, convenience and universality. In transportation the people desire to be able to travel to and fro regularly, quickly, safely and comfortably. In water supply they demand plenty, with purity, attractiveness and adequate pressure. In light, they ask for quality and reliability. In communication, they demand courtesy, promptness and convenience. In everything they desire the minimum of cost. The private corporations, on the other hand, demand security for their investment, liberal salaries for their work, and all the profit

they can get for both money and management.

The Justification of Truces

It is evidently impossible that the predominantly private interest in the public utilities of the country should be transformed in a day to a predominantly public interest. To reconstruct the public relations of a series of such tremendous private industries is no child's play. It means primarily the transfer of title to an enormous investment from private individuals to public agencies. It means also the development of a great organization of public utility administrators able and willing to operate the utilities from the point of view of public service. Meantime, the utilities themselves must not only continue in operation, but must continually expand to meet the rapidly increasing needs of the urban communities. The transformation of which I am speaking is rendered more difficult because, so to speak, the bridge must be reconstructed while the trains continue to run over it. For these reasons we have to tolerate truces and peace agreements, even though they settle nothing, but merely give us a chance to go on. The essential thing is that every truce and every contract should be charged with the energy of conflict and should never be based upon a surrender of public rights. All the ground that is conceded because the city is wearied of the fight, or because it is deluded into the belief that its interests are one with those of the public service corporations, will have to be recovered by harder fighting in the future.

The first really modern adjustment of a great utility problem in an American city was the Chicago street railway settlement of 1907. The Chicago settlement was of great service to the companies in its recognition of a fixed capital value under conditions that amounted almost to a guaranty of the integrity of the investment and a safe annual return upon it. The city secured the advantage arising from a complete overhauling and reconstruction of the street railway system, the installation of modern equipment, the granting of universal free transfers and the extension of the lines from time to time. The city also got the advantage of having a definite agreement as to the price at which the property could be taken over at any time. For the purpose of giving the city the financial ability to exercise this option, a street railway purchase fund was established into which has been paid from year to year 55 per cent of the surplus profits of the enterprise, the present owners of the street railways being first entitled to a return of 5 per cent upon the recognized capital value or purchase price. This fund now amounts to nearly $14,000,000.

Lessons from the Chicago Settlement

The Chicago settlement, while serving as a model of civic statesmanship in certain respects, also serves as a warning against certain mistakes. The capital value or purchase price originally agreed upon was far in excess of the actual value of the physical property at that time. The junk value and unexpired franchise value included in the appraisal were considered as a concession by the city in the interest of peace. Under the terms of the settlement, however, these intangible values have been largely increased in the process of rehabilitation of the system, so that, according to the estimate of Mr. Bion J. Arnold, chairman of the Board of Supervising Engineers, the purchase price as it now stands on the books is about one-third greater than the actual value. In a recent address before the Commonwealth Club of California Mr. Arnold estimated that at the expiration of the twenty-year franchise in Chicago, the capital value or purchase price of the properties would be about $204,000,000, while the actual value at that time would be only $140,000,000 or $150,000,000. He estimated that the street railway purchase fund, if invested and permitted to accumulate at 5 per cent annual interest, would reach $90,000,000 by 1927. It is to be noted, however, that another mistake of the Chicago ordinances was their failure to provide for the investment of the street railway fund in the bonds issued for the rehabilitation and extension of the properties. The result has been that the fund, instead of accumulating at the rate of 5 per cent as assumed by Mr. Arnold in his estimate, has been earning only the current rate paid by the banks on the city's daily balances, which is about 2¼ per cent. Thus we see that, even assuming the 5 per cent rate of accumulation, two-thirds of the purchase fund at the end of the franchise period will be required to pay

for the "dead horse" in the capital value, and if the fund continues to accumulate at 2¼ per cent it will take nearly *all* of it to pay for this animal then long in his grave. Another mistake in the Chicago settlement was its failure to provide any adequate means for the continuous control of operation by the city. The Board of Supervising Engineers, on which the parties have equal representation, was given admirably complete powers for the audit and control of new capital expenditures and the maintenance of the physical property, but was left with very little direct power over service.

An Automatic Cost-of-Service Schedule

The Cleveland truce of 1910 came after a continuous struggle of many years in which the chief aim of the city was to secure low fares. Under the so-called "Tayler ordinance" this result has been accomplished, and the patrons of the Cleveland street railways have been paying three-cent fares, with an extra cent for a transfer part part of the time and with transfers free part of the time. The Tayler ordinance is constructed on the theory of securing street car transportation at cost. A certain fund is established which operates as an automatic regulator in the matter of fares. The ordinance contains a series of fare schedules. When the interest fund is depleted below a certain figure, the fares automatically go up a notch, and when this same fund increases beyond a certain maximum, the fares automatically go down a notch.

As in the case of the Chicago settlement, the company's investment was agreed upon, but its security under the Cleveland ordinance is even greater because it is more carefully safeguarded at the expiration of the franchise. Under the Chicago ordinances the minimum annual return, if earned at the fixed rate of fare, is 5 per cent, and to this is added the companies' share of the surplus profits, with the result that the companies have actually secured a 7 per cent annual return upon their recognized investment. In Cleveland the company is entitled to 6 per cent on the portion of its capital represented by stock and floating debt, and the actual rate of interest, not exceeding 6 per cent, on its bonds. This return is assured in case it can be earned at any rate of fare up to the maximum rate provided in the ordinance schedules, which is four cents with a penny for a transfer, but the company, having no share in surplus profits, is unable to increase this rate by the exercise of diligence or economy, or otherwise. Cleveland has put low fares first on its program. Good service and extensions are a secondary consideration. While the city has secured the option of purchasing the property at a fixed price, no provision is made in the ordinance for the accumulation of a purchase fund and no margin is left in the fares charged for the establishment of such a fund. A considerable proportion of the purchase price or recognized capital value represents perpetuated franchise value, but the Cleveland property was in so much better condition than the Chicago property as not to be in need of immediate and general rehabilitation. Moreover, under the Cleveland ordinance, renewals are charged to maintenance up to the full amount of the original cost of the parts renewed, so that the ratio of intangible value to tangible value in the purchase price, so far as it applies to the original property, is not materially increasing as it is in Chicago.

Extended Service at Standard Rates Guaranteed by the Taxpayers

In New York, where the city has recently embarked upon a great rapid transit project in coöperation with the private companies now operating rapid transit lines, the main purpose of the city was to secure an extension of service at the five-cent rate to take care of the immense and rapidly increasing traffic of the metropolis. The city had already been committed to the construction of subways at public expense, but felt unable to provide sufficient funds for the construction of all the new lines needed. Moreover, the city was not ready for municipal operation. Under these circumstances, after many years of strife with the companies, it entered into partnership contracts with them, under which a certain amount of capital is being furnished by the companies and the balance by the city. The rapid transit lines constructed from the proceeds of this joint fund and equipped by the companies, technically are owned by the city from the beginning, but actually will be held by the companies under long-term leases. In New York the necessity of rapid transit

—cheap and lots of it—was so fully recognized that the city consented to put its credit and its taxing power behind the enterprise. Accordingly, in each portion of the "Dual System," so-called, New York will have the five-cent fare with free transfers. In order to secure an approximately universal service at a uniform rate, the contracts provide for the operation of the new lines in conjunction with the existing rapid transit lines already owned and operated by the companies. In order that this uniform rate should be five cents, even though the cost of service on these immense systems should prove to be in excess of this rate, the city has agreed to permit the companies to take out of the joint earnings, when the new lines are completed, as preferential payments, annual amounts equal to the companies' past annual profits. These preferentials, together with 6 per cent upon the new capital supplied by the companies, will be taken out of earnings before the city receives anything for interest or sinking fund on account of the new capital which it is supplying. In other words, New York has gone a step further than either Chicago or Cleveland in guaranteeing the companies' investments. It has gone into an uneven partnership, giving the companies a first mortgage to the amount of their investments, and contenting itself with a second as its security. It is a noteworthy feature of the New York subway contracts, however, that the private capital invested in the city-owned lines is to be amortized out of the companies' preferentials within a fixed period.

Amortization of the "Water"

In Kansas City, Mo., a big street railway settlement was ratified by the people last July. The Kansas City plan differs in certain respects from all the plans that have preceded it. The recognized capital value or purchase price is fixed, as in the Chicago and Cleveland ordinances, subject to an element of uncertainty in the determination of the value of the company's right to participate in surplus profits. The original capital value, as recognized in the ordinance, is about one-third greater than the actual present physical value of the property. The company is allowed a basic return of 6 per cent upon this capital value, but recognizing one of the grave faults of the Chicago settlement, the Kansas City negotiators provided that the surplus net profits, over and above this 6 per cent return, should be put back into the property without any increase of "capital value" until the actual value of the physical plant is brought up to an equality with the recognized capital. After this has been accomplished, the surplus profits are to be divided in the ratio of one-third to the company and two-thirds to the city. Unless the city determines otherwise, its portion of the surplus will be put into an amortization fund to be invested in the plant or in its securities, until the city comes to have a one-half interest in the entire property. At that time, title to the property will pass from the company to the city, subject to the lien of the portion of the capital value remaining unpaid, and the company's right of participation in the surplus will cease.

After the "water" has been worked out of the original valuation by the use of the surplus, the city may, if it so desires, stop the process of amortization by devoting its share of the surplus to a reduction of fares or to some other public purpose. The initial rate of fare provided for in the ordinance is five cents for adults and half fares for children from eight to twelve, inclusive, with universal transfers, children under eight to be carried free.

Supervision of Operation

In Cleveland the Tayler ordinance provides for a city street railroad commissioner. This official is appointed by the mayor and his salary and expenses are paid by the company as a part of the cost of operation. He is given substantially complete control over new construction, service and maintenance. In New York supervisory authority is retained by the public service commission, both as to operation and, within certain limits, as to expenditures. In Kansas City a novel plan is adopted. The city is to have minority representation on the company's board of directors, and the actual control of operation is to be in the hands of a board of control consisting of two members, both of whom are designated in the first instance in the franchise ordinance itself. One represents the company and one the city. If these two men disagree on anything, an arbitrator is to be called in to settle their differences.

The city's representatives on the board of directors are not directly responsible to the city government. The original directors are named in the ordinance and their successors are to be appointed by the members of a court, which includes Kansas City in its jurisdiction, from lists submitted by the mayor. The judges, however, are authorized to reject all names submitted by the mayor and keep on rejecting them until he submits names satisfactory to them.

Plans for Self-Regulation

In recent years, in the discussion of the problem of street railway control, one of the most serious difficulties has been to suggest a plan by which the companies' motive for economy and efficiency can be enlisted without at the same time putting a premium upon bad and insufficient service. In the street railway franchise negotiations now pending in Des Moines, the ordinance drafted by the company contains a provision for the Boston sliding scale. It provides that the capital stock shall be not less than 25 nor more than 50 per cent of the aggregate amount of the securities outstanding, and that the company shall be entitled to earn 6 per cent dividends. This is on the basis of a straight five-cent fare. If, however, the company should sell six tickets for 25 cents, then it is to be allowed to pay 7 per cent dividends; if it sells five tickets for 20 cents, the dividend rate may be 8 per cent; if it sells four tickets for 15 cents, dividends may go up to 9 per cent; and, finally, if it sells ten tickets for 35 cents, it may declare 10 per cent dividends.

In the operation of street railways, *service*, in the broad sense of that term, is so important and is composed of so many different elements, that this crude sliding scale plan of self-regulation seems to be inappropriate. In this plan the entire emphasis is put upon the rate of fare, and naturally the company's financial interest would lie in the direction of overcrowded cars and inadequate service. This particular form of the sliding scale is intended to make public regulation unnecessary. In fact, if the company's rate of profits is to be controlled by the rate of fare charged, the interference of the public authorities in the matter of service would necessarily impair or destroy the effectiveness of the scheme. The sliding scale, therefore, implies self-regulation and non-interference on the part of the public. But under this scheme of self-regulation, the only direction in which the company would have any motive for favoring the public is in the matter of low fares, and the service, being unregulated either by authority or by motive, naturally would go to pieces.

Steps Toward Municipal Ownership

San Francisco, Detroit and Toledo have pledged themselves to a program of municipal ownership of street railways, but in each of these cities the pledge was made only after years of struggle, and it is still quite uncertain how far this pledge will be carried out. San Francisco has acquired and reconstructed a small portion of the street railway system of the city. It is now building important extensions to the municipal lines, one of its motives being to provide adequate service for the Panama-Pacific exposition of 1915. Now that the Railroad Commission of California has unearthed grave financial irregularities in the management of the United Railroads of San Francisco, that corporation is more or less of a mind to sell out to the city. Most of the San Francisco car lines are operated under franchises which still have about fifteen years to run. These lines, as now operated, show a very high earning power. They are loaded down with stocks and bonds, the par value of which is, perhaps, three times the actual value of the physical property. The city, which is about to take over the Spring Valley water works and also to develop the Hetch-Hetchy supply, will have consumed so much of its available credit in these enterprises as to make the direct purchase of the United Railroads entirely out of the question. The city authorities, anxious to get control of the entire street railway system, and strongly tempted by the rich profits now being earned by the private company's lines, are trying to figure out some sort of contract scheme in accordance with which the system may be made to pay for itself out of earnings. Of course the company will not voluntarily surrender its lines unless the city is willing to pay not only the value of the physical property, but also the estimated earning power of the franchise. In a recent public address, Mr. Jesse W. Lilienthal, president

of the company, called attention to the fact that the company's estimated net earnings during the remaining life of the franchise was some $107,000,000; and, gently dangling this attractive bait before the greedy eyes of the San Franciscans, he intimated that the system of the United Railroads would be a very fine paying property for the city to own and that he would be glad to sell it for a very fine, fancy price.

In Michigan, cities have enjoyed the constitutional right to own and operate public utilities since the new constitution went into effect five or six years ago, but to make this right *practically* effective, general legislation or special legislation in the form of charter amendments was required. After much delay and litigation over technicalities, Detroit at last got a chance to vote in April, 1913, on a municipal ownership charter amendment. This measure was adopted by more than a four-fifths affirmative vote. Under its provisions a board of street railway commissioners has been established consisting of three unsalaried officials, appointed by the mayor. It is the duty of this board "to proceed promptly to purchase, acquire and construct and to own and operate a system of street railways in and for the City of Detroit, and as soon as practicable to make said system exclusive." Many of the most important franchises of the Detroit United Railway have expired, and of the remaining ones the most important is the celebrated Pingree three-cent fare grant, covering about one-third of the mileage. This grant expires in 1924. The city has refused on several occasions to renew the expired franchises, and the task of the street railway commission is to drive the company out of the street railway field, either by the purchase of its lines or by the gradual substitution of municipally constructed lines. The commission is now negotiating for the purchase of all the company's lines, and to this end is having an appraisal of the company's property and franchises made under the direction of Prof. Edward W. Bemis.

The Street Railways to Pay for Themselves

Perhaps the most significant thing about the Detroit plan is that the city has not pledged itself to low fares. The municipal ownership amendment—ratified, as already stated, by an overwhelming majority of the electors—provides that the rate of fare shall be sufficient to pay: (1) operating and maintenance expenses, including paving and sprinkling between tracks; (2) taxes on the physical property, the same as if privately owned; (3) interest on bonds; and (4) sinking fund charges for the retirement of the bonds. The problem of financing municipal ownership of street railways in Detroit is comparatively easy, because the city is authorized to issue bonds for street railway purposes against the city's general credit to the extent of 2 per cent of the assessed valuation of real and personal property, while the balance of the bonds to be issued will be secured by lien upon the street railway property alone, supported by an emergency security franchise good for a period of twenty years. Unless the city agrees to pay a very large sum for intangible values, this scheme of financing will result in making the bonds issued against the property itself a very conservative investment. There should be no difficulty in selling these securities. Detroit's general city debt is very low compared with most of the other great cities of the country, and accordingly the general bonds issued for street railway purposes will not put a strain upon the city's credit.

Three-Cent Fares or Municipal Ownership

In Toledo the street railway company has been negotiating off and on for several years for a renewal of its expiring franchises, but thus far without success. Last year, just before the close of the Whitlock administration, an ordinance was passed fixing three cents as the rate of fare to be charged on the street railways, beginning March 27, 1914, at the time of the expiration of the company's principal franchises. The company refused to accept this ordinance, but did not at first succeed in getting an injunction against its enforcement. Out of these conditions a most curious situation developed. The company continued to demand the old rates of fare, while many of the citizens offered the new three-cent rate. In all cases where the riders refused to pay the old rates, the company declined to accept the new rates, and as a compromise carried the passengers free. This situation continued until September 12, when an injunction against the further enforcement of the three-cent

ordinance was granted by the federal court. It is stated, however, that even prior to the injunction most of the passengers paid the rates demanded by the company. In the meantime, strenuous efforts have been made by Mr. Henry L. Doherty, who controls the company, to secure a new franchise under some sort of an agreement with the city. He has steadfastly refused to accept three cents as the permanent rate of fare, but he has offered to put the three-cent rate on trial for a year, leaving the subsequent rates to be fixed by the city council, subject to court review, in accordance with the results of the experiment. The city administration, however, has thus far "stood pat" on three-cent fares, with the result that the negotiations have been prolonged and futile. Out of this situation grew a more insistent demand for municipal ownership, which resulted in the submission to the voters early in August of an ordinance providing for the acquisition by the city, not only of the street railways, but also of the lighting, heating and power business owned and operated by the Toledo Railways & Light Company. This municipal ownership ordinance was adopted by a rather slender vote, but under the Ohio law no municipal bonds can be issued for the purchase of a street railway property unless they are authorized by a two-thirds affirmative vote of the electors. It appears, therefore, that before municipal ownership in Toledo can actually be brought about, another election will be necessary, with a possible deadlock resulting between a majority that refuses to grant a new franchise and a minority sufficiently strong to prevent the necessary two-thirds vote for the issue of bonds to bring about municipal ownership.

Extension Financed by City

One of the most interesting minor struggles of recent years has taken place in Tacoma, where the city as a part of a plan for the encouragement of industry sought to induce the street railway company to extend its lines into the Tide Flats for the purpose of making that area convenient for factory locations. The company refused to make the extension, but finally consented to operate the line as a part of its system if the city would itself construct it. Accordingly, Tacoma Street Railway Fund No. 1 was established and $35,000 of street railway warrants issued to cover the cost. These warrants, following the Washington plan of financing municipal utilities, are secured by a first lien on the gross earnings of the property, and so are not a charge against the general credit of the city and are not secured by a mortgage on the property itself with a contingent franchise. This method of financing has been successfully used before in Tacoma and Spokane. In this particular case the company agreed to lease the Tide Flats extension for a period of seven and one-half years, and pay as rental 4 per cent per annum on the city's investment. As this rental would be insufficient to pay interest and also retire the warrants within so short a period, the city pledged itself to supplement the fund as far as necessary by the loan of moneys received from the street railway franchise taxes. The company agreed to credit the extension with one cent on each transfer between this line and the main system. After the payment of rental to the city, operating expenses and 6 per cent on the company's investment for equipment, the surplus profits of the extension, if any, are to be divided equally between the company and the city.

Terms of Capitulation in Philadelphia

I can hardly afford to bring this somewhat desultory review of the status of the Great War to a close without referring to the Philadelphia situation. In 1907 Philadelphia adopted a false imitation of the Chicago plan of street railway settlement. It entered into a fifty-year franchise contract with the Philadelphia Rapid Transit Company, by the terms of which the company's paving obligations were commuted for money payments and the franchises of the underlying leased lines were made perpetual. The city obtained representation on the board of directors of the rapid transit company and acquired the right to purchase the company's property at the end of fifty years. The curious feature of this arrangement is that when this property is acquired, the city will not become the owner of all the car lines, but merely the owner of the rights of the operating company. As a matter of fact, the old surface lines in Philadelphia are owned by a multitude of underlying companies which have leased their lines to the operating company at rentals which are enormous in proportion to the value of the physical

property. Accordingly, when the city buys out the Philadelphia Rapid Transit Company, the city will become the lessee of these underlying companies, and municipal operation will be subjected to the handicap of these exorbitant rentals, based on the earning power of the franchises made perpetual by the very contract through which the city acquired the option to purchase the rights of the operating company.

Philadelphia is now negotiating a contract for additional subways and elevated lines on a partnership plan somewhat similar to the plan adopted last year in New York. Philadelphia is peculiar among the great cities of the country in its practice as to transfers. The Philadelphia Rapid Transit Company has a virtual monopoly of the operation of street railway lines within the city, but instead of charging a five-cent fare with free transfers, it sells exchange tickets at the rate of eight cents apiece to passengers who desire to use more than one line. One of the principal objects of the city in the pending negotiations is to get rid of these eight-cent exchanges and to place the entire system upon a straight five-cent basis with free transfers. It is estimated that Philadelphians are now paying $800,000 a year extra on account of these peculiar exchange tickets. It is claimed for the Philadelphia program that it will be self-supporting, but the plan involves the assumption by the city of a contingent liability to the extent of the carrying charges on an investment of some $45,000,000. This will have to be met from the tax levy, if the optimistic forecasts of the traction negotiators should not be realized.

The Trend of the Times

These are times pregnant with change. A determined effort is being made all over the country to transform the investments in public utilities from a speculative to a non-speculative basis. This is one step towards stability, improved service, lower fares and greater public control. No city where a franchise problem now arises can afford to attack it in a perfunctory way, as was the rule in the "good old days." These are the times when every franchise application should spell "fight." It is no time for peace, except the temporary truce to bury the dead and care for the wounded, or the honorable treaty that can be secured only after a showing of stubborn intelligence, strength and courage.

Items of Municipal Law

Invalidity of Race Ordinance

An ordinance making it unlawful for negroes to reside in any house upon a street on which a greater number of houses are occupied by white persons is invalid and unenforceable, although there is a reciprocal prohibition against whites occupying houses on streets where a majority of the houses are occupied by negroes. (North Carolina Supreme Court, State vs. Darnell, 81 Southeastern Reporter 338.)

+ +

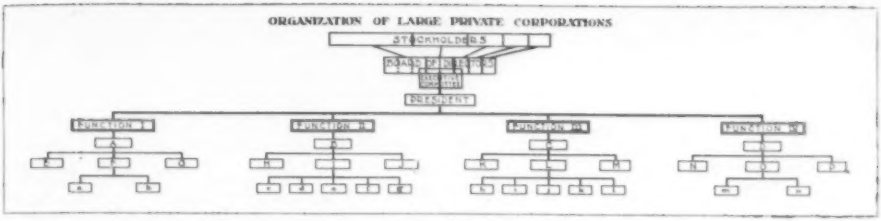
Power to Regulate Use of Tobacco

A city council cannot validly prohibit the using or carrying of tobacco on any of the streets or in the parks or public buildings of the city, it appearing that use of tobacco in the open air could not be offensive. "The ordinance cannot be sustained on the ground that it tends to protect the property of the city from damage by fire. If it were limited to places where quantities of highly combustible materials were collected, it would be less objectionable." (Illinois Supreme Court, City of Zion vs. Behrens, 104 Northeastern Reporter 836.)

+ +

Power to Restrict use of Sidewalks

According to a recent decision of the Maryland Court of Appeals, handed down in the case of Etcheson vs. City of Frederick, 91 Atlantic Reporter, 161, it is within the power of the authorities of a city to prohibit property owners along certain streets from maintaining posts along public sidewalks for the purpose of supporting overhanging awnings, or for the purpose of hitching horses.



TYPICAL FORM OF ORGANIZATION OF A LARGE PRIVATE CORPORATION

A Deadly Parallel

The Old Form of City Government versus the Typical Organization of Large Private Corporations

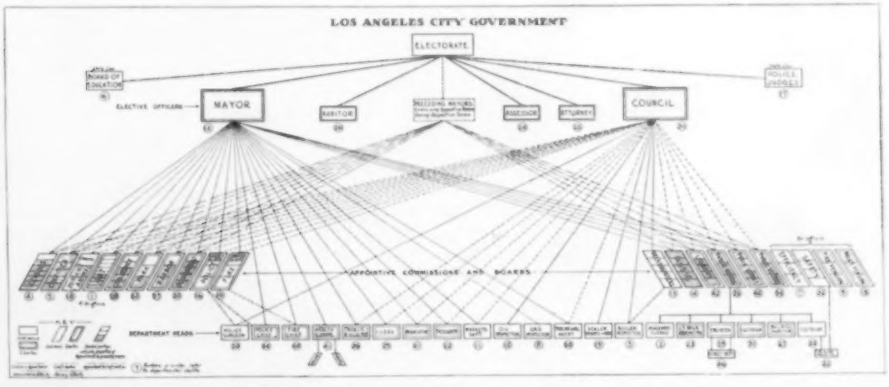
By Jesse D. Burks

Director, Efficiency Department, City of Los Angeles

TO show graphically the distribution of functions and lines of authority in the municipal organization of Los Angeles as a whole and in the several departments individually, there has been prepared by the Efficiency Department a series of about fifty charts. The aim has been to focus the attention of officials and citizens on concrete problems of organization and thus enlist the active coöperation of a large number of individuals in the working out of a systematic plan of general and departmental readjustment.

As a basis of comparison, a chart is presented showing the typical organization of large private corporations. This illustrates graphically the complete centralization of administrative authority and the clear definition, distribution and correlation of powers and functions which have been followed by most large modern business enterprises.

Whatever may be the political and economic advantages or disadvantages of this form of corporate organization, it is generally conceded to be, from an administrative viewpoint, a most effective means of accomplishing desired results. As a form of organization, therefore, it is well worth the careful consideration of students of municipal management. Briefly summarized, this organization conforms to seven well-defined principles of administration, viz:



COMPLEXITY OF THE FORM OF ORGANIZATION OF THE LOS ANGELES CITY GOVERNMENT

An Effective Form of Business Administration

1. The number of officers elected by the stockholders is very small; usually only the members of the board of directors.

2. Each important group of stockholders is represented, according to the size of its interest, by membership in the board of directors.

3. The board of directors confines its activities to general regulation, leaving all details of management to its expert administrative officers.

4. Administrative authority and responsibility are definitely fixed; ultimately on a single head, whose function it is to carry into effect the policies determined upon by the board of directors. This officer is accountable to the board for economy and efficiency throughout the organization.

5. Functions are logically classified and grouped; a single officer being made responsible to the chief administrative officer (president) for the direction of each function.

6. Men of special fitness are chosen to perform each specific kind of service; employes being systematically trained in the service and promoted to positions of progressively higher responsibility.

7. No man is permitted to do work that can be as well done by less expert and less highly paid employes.

The Great Simplifier

THE SHORT BALLOT IS FIFTY PER CENT, OR MORE, OF EVERY CONSTRUCTIVE POLITICAL REFORM

(From the *Short Ballot Bulletin*)

A Cumbersome Form of Municipal Administration

In contrast with this type of organization, the municipal organization of Los Angeles, as shown by the general chart, exhibits the following chief characteristics:

1. The number of elective officers is twenty-four, which experience has shown is larger than citizen-stockholders can or will intelligently elect.

2. Important groups of citizen-stockholders are practically disfranchised by having no representation in the council-board-of-directors. Failure, by even a narrow margin, to obtain a plurality of votes is sufficient to deprive a minority group of citizens of any representation.

3. The city council not only determines matters of general policy, but is practically responsible for any matters of administrative detail, such as the appointment of administrative officers and the approval of purchase orders.

4. Administrative authority and responsibility are widely dissipated and scattered, as between the mayor, the council, 20 commissions, and 20 department heads not accountable to commissions. Of 72 positions on the boards and commissions, the present mayor has made appointments to only 22, the others being either appointees of the preceding mayor or ex-officio incumbents. The mayor's appointments are subject generally, but not uniformly, to confirmation by the council. Four of the 20 department heads not subject to commission control are appointed by the council, and four by the mayor without confirmation of the council.

5. There is overlapping, illogical classification of municipal functions. The function of the commissions is partly that of administration and partly that of directing the policies of administrative officers subordinate to them. Even a casual examination of the organization chart shows an oil inspector, sealer of weights and measures, boiler inspector and other offices independently organized without relation to closely allied service in the general departments. In the detail arrangement of functions within departments similar discrepancies are numerous.

6. Special fitness is not uniformly the basis for assignment of duties, and cannot be under a system of disintegrated authority. Moreover, the constant tendency to change of personnel in the positions of higher administrative authority makes it generally impossible for the city to have the service of well-trained officers in these positions.

7. Highly paid officials are performing duties of a routine character that might be better performed by clerical or other subordinate employes at lower salary cost. In some cases such distribution of duties is prescribed by charter; in others it is the result of inherited defects which have come down from the past.

Fire Prevention in Department Stores, Theatres and Other Buildings

By Joseph O. Hammitt

Chief, Fire Prevention Bureau, New York City

EDITOR'S NOTE:—*At the recent Conference of Mayors and Other City Officials of the State of New York, at Auburn, much interest was taken in Mr. Hammitt's address on "Fire Prevention as a Municipal Function." In order that other cities may profit by what the present administration in New York is doing to reduce fire losses,* THE AMERICAN CITY *has asked Mr. Hammitt for a recapitulation of some of the main facts of his Auburn address, together with a statement of his ideas as to the life hazard in the department stores of big cities, as emphasized in his subsequent testimony before the State Factory Investigating Committee. The following article is the result.*

TWO important conditions confront us in the department stores—one complex, the other more or less simple. The complex problem is how to make the old buildings long utilized as department stores safe for such occupancy. In dealing with new constructions, the problem is more simple, since we can carry out plans which would be impossible in many existing buildings.

The business of a department store, as at present conducted, involves the creation of one of the worst fire hazards; namely, large unbroken areas, loaded with heavy combustible materials and not separated by fire stops. There are many interior open stairways, rotundas and shafts of one sort or another, for light and ventilation. It is difficult for the Fire Prevention Bureau to deal with them in a way that, while protecting life, will not seriously hamper the operation of business. While the protection of human life necessarily comes first, we must conscientiously endeavor not to embarrass business.

I suggested before the Factory Investigating Committee that the large rotundas and shafts in existing department stores which could not conveniently be shut off, and stairways not included among the required means of exit, might be protected by efficiently designed water curtains. It is essential for the protection of life in department stores that these great floor openings be prevented from communicating fire. Sufficient fire-stops on each floor, to prevent the spread of flames, are also essential.

Interior stairways treated as required means of exit should be enclosed in fireproof partitions, and should lead directly to the street. This is necessary in existing buildings as well as in new buildings.

Obviously, no matter how small the floor area, each such area between fire walls must have as a minimum two means of exit. Otherwise, if a fire occurred in such location in that floor area as to cut off one means of exit, there would be no way whatever for the occupants to escape. These two means of exit must necessarily be removed from the center, and so located that no matter where the fire occurs the occupants of the entire floor area can escape from the scene of the fire and reach an exit leading to a place of safety.

But this is only the necessary minimum requirement. In computing the number, location, and character of exits in a department store, it is necessary to apply precisely the same principles that should be applied to determine similar exit facilities in any other kind of establishment where

large numbers of people congregate. It has been estimated that a doorway 20 inches wide will permit forty persons to pass through it in a minute. In computing the total number of persons that would use these exits in a department store, we have to base our calculations on the most dangerous conditions that might arise—say, a fire panic in one of these stores during a Christmas rush.

It is doubtful if there is any economical and feasible method of making the upper stories of some of the big stores safe for their occupants except by dividing these large floor areas by fire walls with means of exit through these walls on each story protected by self-closing fireproof doors.

If, in the average department store in New York, we provided a sufficient number of fireproof enclosed stairways to render that store safe for its occupants, we might destroy so much of the usual window space and take so much of the floor area away from mercantile uses that it would affect the price of goods, because store keeping would become so much more expensive. Hence, the only way in which the average department store of many stories can be made safe for its occupants is by providing on each story a sufficient number of horizontal exits. If that is done and the floor spaces are so arranged that the aisles lead directly to exits, the furniture being made immovable so as to give less opportunity for the blocking of the aisles, the stores can be made safe places in which to work and to shop.

In constructing these horizontal exits and arranging these aisle spaces, each separate store would have to be considered on its merits. The carrying out of this plan need not necessarily involve great expense. Many department stores have started as small mercantile units and expanded by the addition of new buildings. In building these extensions, naturally, walls have been erected. These walls could readily be adapted for our purposes.

There seems to exist an impression that there have never been any serious fires in

A FIRE STOP BETWEEN TWO PARTS OF A BUILDING
An effectual means of preventing the spread of fire

department stores where life has been lost. This idea is erroneous. While there has been no such fire in New York City in our modern department stores, there have been fires in various parts of the country in department stores and in "five and ten cent" stores in which life has been lost. One fire abroad, in London, in which a number of lives were lost, was typical of conditions such as might be found in New York City to-day. It seems that, in the case referred to, Christmas decorations caught on fire and rapidly carried the blaze throughout the building. The building was a three-story structure with unprotected floor openings and large undivided spaces such as we have in New York. So rapid was the spread of the fire, and so much inflammable material fed the flames, that lives were lost before the occupants of the building had an opportunity to make their exit. The Christmas rush in our department stores certainly adds greatly to the hazard. If fires have not occurred in these buildings at such times, it is more due to fortunate accident plus the "good housekeeping" practices of department store managers, than to any other consideration. But we do not wish patrons of department stores in this city to depend upon anything so uncertain.

A BROAD AND CAPACIOUS FIRE ESCAPE

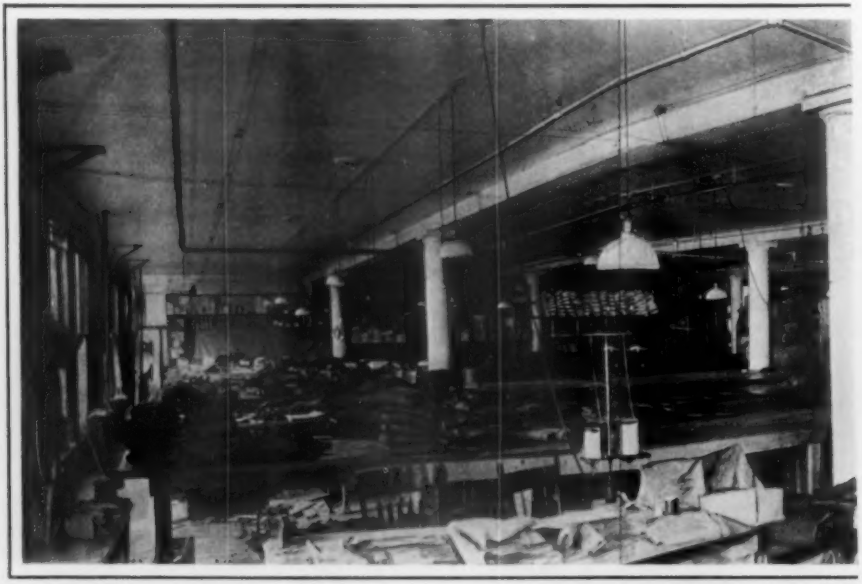
Much of the work done by the Fire Prevention Bureau under the direction of the present Fire Commissioner, Mr. Robert Adamson, has been of a novel character. After eight months of trying out these various innovations, it might be stated that the experimental stage in most of them has been satisfactorily passed. Among the most important of these innovations are the monthly housekeeping inspections by the uniformed force. It was said by many that this idea was impracticable. However, it worked. Moreover, it has been a great success, and I cannot too strongly recommend that other municipalities follow New York's example in putting into requisition the uniformed force for making such monthly inspections.

Since every building in the city, other than private dwellings, is visited each month, the inspections cannot cover all questions of structural conditions. The men engaged in these housekeeping inspections are directed to call the attention of the persons in charge of buildings to such obvious fire hazards as accumulations of rubbish, and to palpable defects in standpipe equipment. They forward to the Bureau of Fire Prevention reports of the most serious conditions observed where a complete inspection is required, or where their verbal directions are not obeyed. The necessary formal orders are then prepared and served by the Bureau of Fire Prevention. The firemen are instructed to use diplomacy and to be courteous to the owners and occupants

AFTER THE FIRE IN THE ASCH BUILDING, MANHATTAN,

of buildings inspected, and the Fire Commissioner has even received letters from business men expressing their pleasure at having the uniformed men visit their buildings to point out fire dangers. It makes the men better firemen by enabling them to become acquainted in advance with building conditions with which they may have to deal.

More than 100,000 such inspections are now being made each month in New York City. They have resulted in an enormous cleaning up of rubbish piles, which are acknowledged to be the principal fire breeders. In the course of a year these



THE ASCH BUILDING SIX MONTHS AFTER THE FIRE,

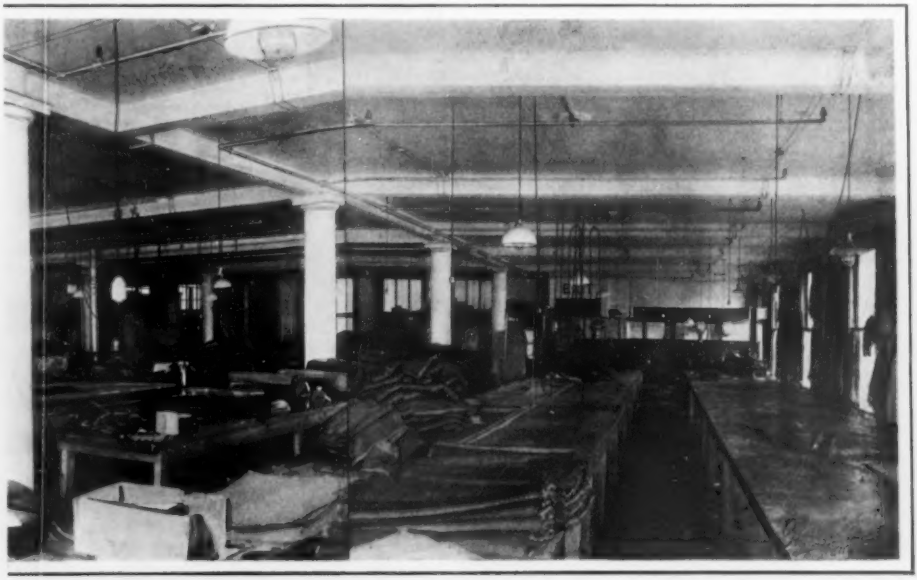
IN WHICH 145 PERSONS WERE KILLED

housekeeping inspections should show results in a reduction in the number of fires.

Protecting the Theatre-Going Public

One of the heaviest responsibilities of the Fire Department is to protect the theatre-going public, including the tens of thousands of patrons of moving picture shows. In New York City we have fairly adequate ordinances setting forth the requirements necessary for the safety of the theatre and moving picture patrons from fire and panic dangers.

The principal difficulty has been with the



SHOWING THE SPRINKLER SYSTEM

enforcement of these requirements. It was frequently found quite useless to exact a penalty, inasmuch as some managers considered it more economical and convenient to pay the penalty than to comply with the law. This year we discovered in the city of New York how to enforce these ordinances: we notified the theatre managers that their licenses would not be renewed unless they complied with all the requirements. Theatre licenses expired on the first of May. I imagine that in the six weeks immediately preceding the first of May there was more work done in existing theatres in order to render them safe in case of fire or fire panic than during any equal number of months in the previous history of the Fire Department. The sudden solicitude for the welfare of the public displayed by certain theatre managers who had disregarded the law was quite touching. Orders which had been issued each year, beginning with 1910, were enforced for the first time in April, 1914. In those cases where it was physically impossible to complete the work before the license expired, the licenses were renewed until we were satisfied that extra precautions were being taken and had every evidence of good faith that the orders would be complied with within the shortest possible time. In cases where work was actually commenced before the renewal of the license, or where the work was delayed by reason of the time consumed in passing upon plans in the Fire and Building Departments, we obtained from the managers, and placed upon file in the Fire Department, the original contracts calling for the work to be done.

Let me give you an illustration of how rapidly things can be done when they become necessary to the grant of a theatre license: In one of the theatres a standpipe outlet was located in a private office, the door of which was frequently locked. The Fire Department ordered this standpipe outlet moved into a stairway enclosure where it would be accessible to firemen in case of fire. It was not until the night of April 30 that the importance of complying with this order was fully appreciated by the theatre management. The men were put to work that night, and on the morning of May 1 a telephone message was sent to the Department stating that the order had been complied with over night, and asking for an immediate inspection in order that the license might be granted.

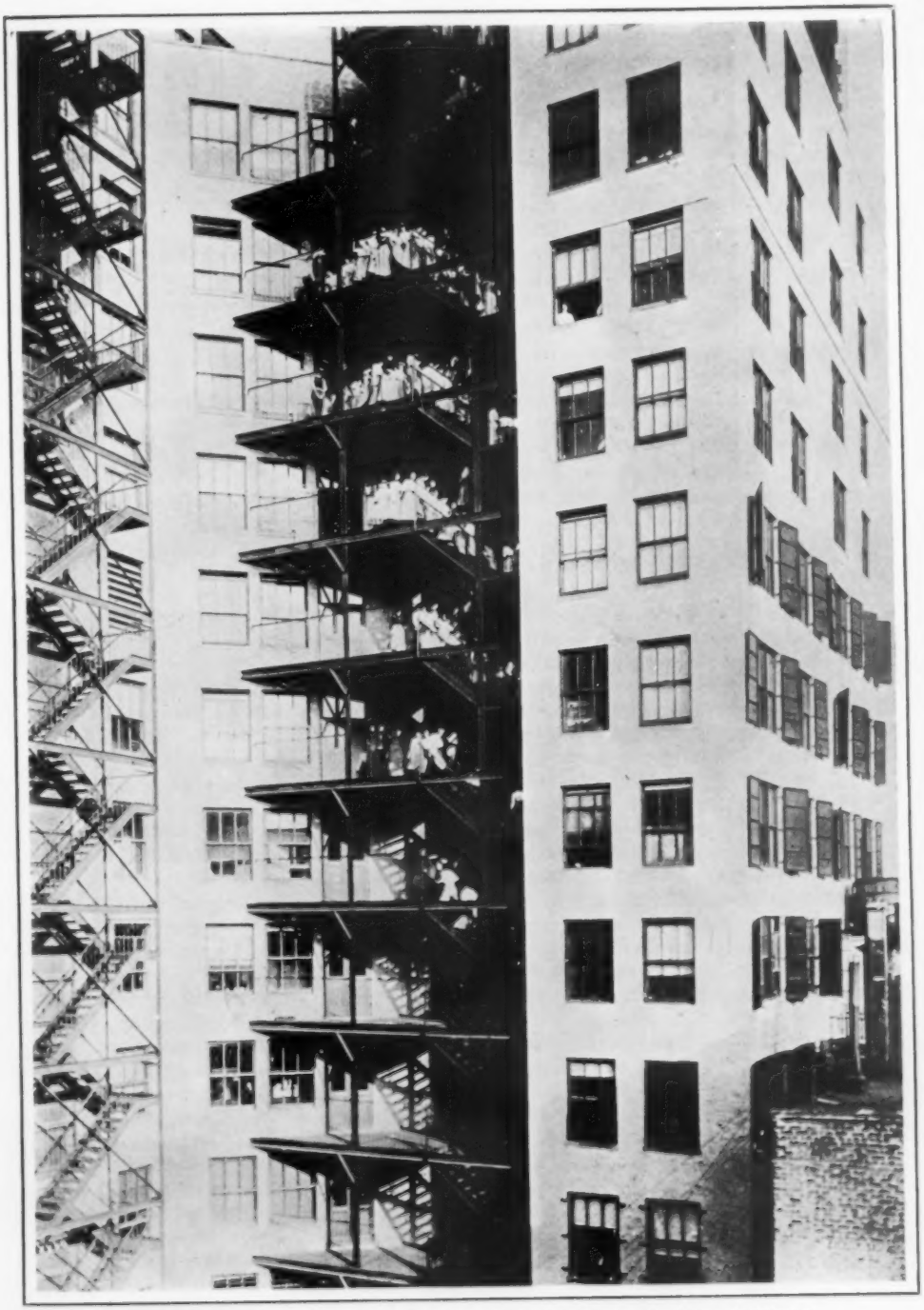
Educational Work

Another important feature of our work in New York, which I strongly commend to the officials of other cities, is the educational work. Illustrated lectures on fire prevention are given in the public schools, to civic societies, business associations, Y. M. C. A. meetings, Boy Scout organizations, and wherever suitable audiences can be secured. Several hundred thousand copies of fire prevention warnings in printed form have been distributed.

Just at present the Fire Department is coöperating with the Board of Education to introduce a course in fire prevention as a part of the curriculum in the public schools. We are also taking up seriously the use of the moving picture theatres for the campaign of education. The Fire Department is coöperating in the preparation of moving picture scenarios that will carry fire prevention warnings to audiences all over the United States. The possibilities of this work are enormous.

Legal Responsibility for Fires

Still another thing we have attempted in New York is of special interest to other cities. Perhaps you know that in some foreign countries a person on whose premises a fire is started is frequently held responsible for the cost of extinguishing the fire and also for damage to the property of others. I do not know exactly how the laws under which this responsibility is fixed in foreign countries are phrased, but we have in the Greater New York charter a provision under which we think that if a fire occurs or spreads, because of the absence of precautions required by law or by lawful orders of the Fire Commissioner, the owner of the premises or person responsible for the violation is liable for the cost of putting out the fire and injuries to firemen sustained in fighting it. No suit had ever been brought under this section of our city charter until the present Fire Commissioner, Robert Adamson, went into office. We had a disastrous smoke fire in the cellar of a loft building. It could easily have been extinguished by a single company without danger to the firemen if an order of the Bureau of Fire Prevention for the installation of a sprinkler equipment had been complied



CLEARING A 12-STORY FACTORY OF 2,000 EMPLOYES IN FOUR MINUTES

The wire-glass windows facing the landings would hold a fire in check while the workers were descending. The stairs accommodate three persons abreast

with. Because of failure to comply with this order, Commissioner Adamson holds that the Greenwood Cemetery Corporation, which owns the building, is responsible for the cost of putting out the fire, and he has brought suit to recover. The decision of the lower court being unfavorable, the Commissioner has appealed to the Appellate Division. We expect to bring suit also for the injuries to the firemen. Perhaps if we succeed it will be clearly established that the Greenwood Cemetery Corporation must indemnify all those who suffered loss in the fire. Once that is established, many people will be more careful.

But suppose we do not succeed in our suit. Will it not be clear that the law should be changed so that such suits will succeed in the future? Should there not be such a law, not only for New York City, but for every city? Would it not be fair to relieve the taxpayers who are so careful as to avoid fires, of the expense of putting out fires started through the carelessness of others?

WHAT TO DO AND HOW TO DO IT

How to Plan for Fire Protection in Congested Districts

By W. A. Starrett

THERE hangs above my desk a long panoramic photograph of Baltimore, taken just after the great fire. It is not a pretty picture to look at, and yet it is fascinating. The foreground shows acres and city blocks of desolation, and the background shows the tall fire-swept skyscrapers, also in desolation. The aspect is that of the city of the dead. The streets have been cleared for the reëstablishment of vehicular traffic, and that is all. Desolation and ruin rule on every hand. A couple of horse-drawn street cars, which by chance appear in the picture, seem strangely out of place, and the few loiterers among the piles of débris give to the picture that tragic aspect of human helplessness that mutely tells the story of the feebleness of man in the presence of a great conflagration.

To one who is interested in observing the full meaning and import of the scene, the picture denotes prophecy as well as history. Indeed, since the burning of Baltimore, its prophecy has more than once been realized. A picture of San Francisco burning looks much the same as Baltimore burning, and, to one not familiar with either city, the great panoramic photographs of these ruins look so much alike that an explanation is generally necessary.

I saw Baltimore burn—that is, I was there on successive days as it was burning—and, as it was my business to observe more or less intelligently what was going on, I may say that I saw it burn. It was said to have started in a small way. All fires start in a small way; probably the first fire that our simian forebears ever dared to approach started with no less mystery than the average modern fire, and yet the parable of small beginnings and large and quick results cannot be more readily turned than around the incidents of the starting and spreading of fire. And right here it might be well to note that nowhere in his dealing with the great force of nature does man so disregard what engineers call the factor of safety as in his dealing with fire. A thick sheet of iron or of brick, or, indeed, small distances with only air intervening, generally separates that germ of uncontractability from the potential calamity that is ever hovering near when man deals with fire. And yet utter carelessness and even recklessness are so common that

it might be said that, in the average handling and use of fire, man not only neglects the factor of safety, but carries a large part of his activities, so far as fire is concerned, clear into the realm of chance. Underwriters' actuaries have figured it all out, as our enormous national bill for fire insurance premiums will testify; but the average man knows it not, and to-day in our most congested metropolitan districts is the place to look for rickety stoves on wobbly legs, kerosene and gasoline cans standing open beside them; or small activities, such as smelting, baking, tinning and a thousand and one other pursuits that require fire in direct contact; all in non-fireproof buildings, inadequately protected and ignorantly exposed to the greatest terror that can beset humanity excepting, perhaps, warfare.

The burning of Baltimore—and I dwell upon that because it was so typical of the conditions in nearly every large American city—was a revelation of the importance of all modern fire-fighting skill in the face of a well-started fire. To the spectators it was absolutely ludicrous. Here was a great area smoking and burning, with the fire fighters working around the edge of the area. The streams of water were as mere cobwebs touching here and there parts of the fire. The sun shone brightly where the smoke was wafted away by the mild breeze that blew. Citizens stood about in awe-stricken groups watching, apparently not knowing what to do or where to go. Occasionally a fire department would be seen picking up its equipment to rush to another point of vantage. Fire companies from other cities were sent in as they could be spared, and these would be seen occasionally racing by detour around some part of the burning area to take up the attack. On the second day we commenced to hear the booming of dynamite, for they had decided to tear down great sections of the city to prevent further spread. Through it all the same helpless awe and apathy reigned supreme, as well it might, for men were seeing the result of the overstrained factor of safety when chance had broken in against them.

And through it all Baltimore burned—burned miserably and helplessly while a couple of hundred thousand people gaped and wondered and applauded the pigmy efforts of one of the most efficient and bravely managed fire departments known in this country.

And so when I was asked by the editor of THE AMERICAN CITY to write in this brief space something about how to plan a city to prevent conflagrations, I felt that to attempt to treat the subject in so short a space would be something of an undertaking. Nevertheless, a few points will bear emphasizing, even in this short space.

The Appeal to Common Sense

All experts on the subject agree that the first great watchword, and, indeed, the cornerstone upon which all intelligent progress must be founded, is prevention—prevention in its human sense. It starts with common sense—an appeal to men to acknowledge the potential power of a most minute beginning and to take it out of the realm of chance and give to its safekeeping at least a part of that factor of safety which it deserves. But all that means education—perhaps a thousand generations of public education; and in the meantime what can be done to compel realization of this first and greatest communal responsibility?

In view of the hit-or-miss way that American cities, and, in fact, nearly all cities, have grown from small beginnings, it is probably true that every theorist on the subject knows that he could design an ideal city if a spot in the wilderness were only assigned him with autocratic powers at his command, to have things arranged to meet this prime requisite of community life—how to free the city from the danger of a great conflagration.

As the question comes to me, a broad and sweeping premise must be assumed; for the question of the kind of city, its size, its activities, and last, but not least, its form of government, must be taken into account. Obviously a very small city, a village, assuming that it has an adequate water supply, has very few of the complexities that occur in a larger place; and yet generally the foundation of the conflagration of later years is laid in the neglect and lack of forethought here shown. The most inexcusable sin of a small community is the permitting of congested tenement sections to grow up. An element of stupidity is also chargeable when it is considered that in such communities land is always cheap, and there-

fore such congestion is the result of ignorance of proper living requirements rather than of economic necessity.

But since it is an immediate problem that we are to consider, let us assume a city of, say, 200,000 inhabitants, located in such a way that it may grow in every direction; its water supply is good and adequate; its activities are diverse and its population cosmopolitan. Let us assume that its government is clean and unified and modern, unhampered by an emasculated code of laws that has been handed down to it by a previous generation of tinkering politicians. While the physical aspect of such a city will determine its fire-resistng qualities, the part played by its government is so important that it is fair to say that the first great requisite toward the goal of complete prevention is proper and unified authority intelligently conferred by law upon those who shoulder the great responsibility of preventing fires. Without attempting to discuss the governmental aspect of the problem, I think that experts are agreed that those cities which have a definite department of public safety, which includes policing, public health, public works, fire prevention, the supervision of buildings and the care of highways, are best equipped to cope with the problem. So, assuming the laws and the administration thereof to be the best, the city itself should next be considered.

How Wide and How High?

Wide streets are fundamentally required; the most casual observer understands that—especially when he is hurrying through a crowded section of an imperfect (to his notion) city. But they must not be too wide. Public convenience has something to say, and, with rare exceptions, those cities that have been laid out with excessively wide streets find a most astonishing unbalance in real estate values and a most irritating tendency on the part of business to jump to places where it never was intended to go. No, wide streets must compromise with other questions; but the question of "how wide?" is also involved in "how high?" How high shall buildings be permitted?—is the great mooted question. I frankly take my stand with the advocates of a height limit, and that limit should not exceed 125 feet. Experience has shown that at about that height the limit of human accuracy in stopping and controlling fires is reached. An endless discussion can be raised on this point alone. Ethical questions, questions of real estate values, taxes, light, air, hygienics, transportation and a thousand others contribute to the discussion. In my opinion there is only one sound point of view, and that is public safety in the event of a great and overwhelming fire. The contemplation is not pleasant of the condition that would arise in a skyscraper district such as downtown New York, with its narrow streets, when a great conflagration would cause the simultaneous emptying of all of those great buildings into the inadequate thoroughfares, the ends of which might easily be blocked by fallen buildings, or even traffic congestion; with transportation paralyzed, panic prevailing in the surging crowd, and fire and ruin being driven in from behind a heavy wind. Such is a combination of circumstances that is easily within the range of probability, and no argument of intensive values or tax returns, or any other, can justify the exposure of a city to such a calamity. Some who read this article may live to see or hear of such a cataclysm, and when it comes it will take a place with the great calamities of the world in the number of people killed—not to be mentioned with such a minor event as the sinking of the *Titanic*.

So the streets should be wide and the buildings not high. A good rule would be that the streets should be 25 per cent wider than the maximum height allowed for the buildings, with minimum and maximum limits, for the streets, of between 90 and 150 feet between building lines. The blocks should not be long, not more than 350 feet maximum, and there should be no alleys. The streets should, of course, not all be parallel, nor all intersections at right angles, and parks and open spaces should be frequently interspersed. Washington, D. C., is, of course, the model of this country, if not of the world, for street arrangement, and yet city planners tell us it could be improved upon.

Watchfulness Especially Needed in Changing Neighborhoods

But since it is the question of prevention that we are considering, we can take the subject back immediately to the buildings and their equipment, having left the street

arrangement to city planners. It is a Utopian dream to assume that every buildng should be fireproof. Economically such a regulation would be ruinous, and, besides, even practical prevention does not demand it. The residential districts with buildings widely separated could easily permit of non-fireproof buildings.

But it is in the constant shaping and changing of neighborhoods that the watchfulness must be exercised. Here the adequate government plays its important part; for with the change in the character of a neighborhood comes the change in its activities, and then must the director of public safety be empowered to dictate the kind of building and its equipment, even to the condemnation of already built structures that have outlived their original usages.

And, as the laws may be lenient in the outlying sparsely settled districts, so should they be most stringent in the congested and manufacturing districts. Here public policy demands that every building be fireproof, with adequate and proper stairways and fire-fighting apparatus. It must be remembered that it is not the buildings, but their contents, that start fires. With the constantly changing stocks of merchandise in the stores and factories, the accumulation of papers, records and furnishing in the office buildings, who can say at any given time what degree of hazard any property bears to its neighbor? No, the only safe assumption is to consider every building as a unit, its contents to be burned wholly and completely within its four walls, with all the protection that can be given to it by complete fireproof construction, including metal frames, wire glass, absence of wood, and ample means of access to it by fire fighters. The courts of the buildings should not only be designed with a view to light and air; they should have in view the control of the fire when, unhappily, it starts.

Sprinkler Systems in the Ideally Planned City

A particular aspect of this subject is found in the question of automatic sprinklers. Every building in a congested district should be required to have a full equipment of these wonderful little guardians of life and property. Existing laws everywhere could well be readjusted to stimulate and encourage the equipment of the large building with this valuable device, very much to the improvement of the fire-resisting qualities of the cities adopting this plan. It is interesting to note here that the city of New York has just won important litigation which gives the authorities the power to compel the equipment of loft buildings with sprinklers.

But even the sprinkler systems as now installed could be improved upon in the ideally planned city in this particular. Whereas now each building so equipped has its own reservoir of water to supply the sprinklers in the event of failure of outside supply, an ideal plan would be to have special community reserve tanks and pumps in each block, supplying on a wholesale scale the reserve water that is now carried in various and variable units.

A congested tenement district is apt to be a part of such a city as we have under consideration. The word "tenement" has come to suggest a miserable, ill-built, unlivable building hardly fit for habitation, albeit the laws of many of the large cities properly define the word as meaning a building in which three or more families may live. The popular misconception arises from the disgusting conditions that are everywhere permitted by modern municipalities. But it is possible for a tenement to be all that it should be, and under the direction of a wise and adequate department of public safty it would be so.

Here, again, prevention should be the watchword. Any building intended to house more than two families should be made fireproof. The shifting character of a neighborhood might easily justify the changing of a detached single residence into a two-family house, but when this limit is exceeded squalor is the almost inevitable result. So it should be mandatory upon the director of public safety to require a fireproof structure when the landowner decides it is to his own interests to have more than two families on a single plot of ground. Starting with that as a basis, the tenements should be in accordance with the established laws of fire prevention, seconded by our knowledge of hygienics. It is not inconceivable that such tenements could be very high. If the stairways are broad and airy, and proper air and light are admitted into them, the limit of height need only be

the limit of practicability governed by the general law for the maximum height for all buildings. But since we are especially considering the "no elevator" tenement, it is possible that the owner would find five to six flights of stairs about all that his tenants would stand. And there are a few additional points to be made imperative. In tenements other than apartment houses and hotels—tenements such as the popular conception implies—the stairway hall should open directly to the street, and on the ground floor to the back yards without doorways, also directly to the roofs. These stair halls should be adequately lighted—naturally by day, artificially by night—and all night lighting should be by the municipality, to insure its effectiveness. Such stairways and hallways should be regarded by the city as public lanes, so far as the police are concerned, and the policing and supervision of them should be even more vigorous and thorough than that of the public highways. The light courts and areaways would, of course, be ample and protected by wire glass, and the doorways from apartments to corridors should be protected by fireproof doors.

Roofs, Parks and Open Spaces

The opportunity should not be lost to encourage the esthetic advantages that the roofs of such buildings would present. Perhaps it would not be too much to require that the roofs be made the playgrounds—certainly it would not be too much to require that the roofs should be usable, safe and as free from obstructions as possible, an idea that is already receiving much attention from the lawmakers. In any event, free circulation between the street, back yard and roof should be assured, so that the patroling and policing of the buildings could be easily and effectively done. Stand-pipes equipped with sufficient and proper hose reels would be run up through the stair halls and to the roofs. With proper coördination with that branch of the department of public safety which would have to do with the hygienic aspect of the city's life, such buildings would be tenements in the true sense—safe, adequate, inexpensive living quarters for the poor—not the quarters for the breeding of tuberculosis and vice that now disgrace many of our leading cities.

Some mention has been made of parks and open spaces. These are important as places of safe congregation of people in the event of a great fire; they are also most important in forming a gap over which great conflagrations could not jump. The dynamiting of the buildings in Baltimore was nothing more than a puny effort to create these gaps—alas! too late. Perhaps a good rule to enforce upon the city planner would be that open spaces of, say, ten million cubic feet, be provided for every possible hundred million cubic feet of building, the factor for cubing to be assumed from the legal height limit. Such spaces would, of course, be located advantageously with respect to isolating the parts of the city section by section. Certainly the advocates of hygiene, light and air would not quarrel with this regulation.

The elimination of overhead trolley wires need hardly be mentioned, as modern cities are already taking steps to accomplish this. Under the wise supervision of an efficient director of public safety, all danger from electrical fires would, of course, be reduced to a minimum.

And such a city as above briefly outlined would be a beautiful, healthful, livable city. With public safety so carefully guarded against the greatest and most menacing danger that can befall a city, would come also such benefits from good light, good air, facility of communication, rapid transit, non-interruption of business by reason of loss by fire,—to say nothing of low insurance premiums,—that it would be found to be a prosperous city, attractive to newcomers and new industries and containing the elements that forever make for the uninterrupted prosperity and industry toward which every city ought to strive.

The Modernizing of New Orleans' Fire Department

By Louis Pujol

Chief, Fire Department, New Orleans, La.

THE modern spirit which has moved the public officials of New Orleans in recent years has not been limited by even the expenditure of $25,000,000 on the drainage, sewerage and water systems.

Perhaps in no department of the city government has civic development progressed to a greater degree than in the character and efficiency of the service the citizens receive from the trained men and

FRONT VIEW OF CENTRAL FIRE STATION, NEW ORLEANS, LA.

MOTOR TRUCK NO. 4 IN FRONT OF THE CENTRAL FIRE STATION, NEW ORLEANS

DRILL TOWER AT THE NEW ORLEANS CENTRAL FIRE STATION

thorough-working apparatus of the fire corps.

The improvements in this department have been especially noteworthy during the past ten years. In 1903, for instance, the total membership, officers and men included, was 290, while to-day it has reached 460, an increase of 170. The number of fire engines operated by the department in 1903 was 27; now there are 31. At present there are 52 fire stations, as against 43 ten years ago. In 1903 the budget appropriation amounted to $260,000; now it is nearly half a million.

Automobile equipment of the most modern type, with crews of seven men each, has replaced the horse-drawn equipment of seven of the chemical companies, and eight large and powerful engines have also been placed in the service of the commercial district.

With regard to water for fire protection, the pressure carried by the mains of the old water works company ranged from about 30 pounds in the business district to almost nothing in the outlying sections, and 1,700 antiquated fire hydrants gave but a very limited and uncertain supply for fire extinguishment. This was the condition along the 125 miles of streets which had water mains at all, while the other sections of the city wherein no water mains existed were almost without fire protection, depending upon water from the nearest canal or river, or upon such water as might be stored in a few underground cisterns which had been constructed at scattered points throughout the city. Since the installation of the new water system, however, the supply has been under good pressure—60 pounds or more, everywhere—and effective fire-fighting with a hose from hydrant pressure from over 5,000 fire hydrants located at every street intersection on 550 miles of street has reduced the fire danger to a very small fraction of that which existed before the new system became operative.

The New Central Fire Station

The latest improvement in the fire department of New Orleans is the new central fire station on Decatur Street, between Bienville and Conti. Practically the entire area of the first floor is devoted to the housing of the fire-fighting apparatus, this area being paved with Granatoid pavement. At the rear is a supply room for oils, waste, etc., and on the opposite side is a kitchenette and dining-room.

Two ornamental stairways, one near the front and the other at the extreme rear, lead to the second floor, where are the living quarters of the chief and assistant engineers and the business offices and meeting rooms of the Board of Fire Commissioners. These rooms open on a spacious corridor, well lighted and ventilated, with marble flooring. At the extreme end of this corridor, and facing the stairway used by firemen in returning from fires, is a large drying-room where wet clothing may be laid out to dry; adjoining this is the shower room, equipped with six showers, all partitioned off in marble. A roof garden and gymnasium are among the other features.

On the left side of the new station is a one-story extension, in which the boiler room, coal room and machine shops are located. In the rear of the yard is a five-story drill tower, built entirely of reinforced concrete. Ladders, fire-escapes, standpipe and other apparatus used in fire drills are attached to this tower.

The new station is fireproof throughout, and there is not a column in the first story, the span of which is 68 feet. The exterior front is finished in an impervious gray pressed brick, with polychrome terra cotta trimmings and finished off at either side with handsome wrought-iron ornamental gates which open upon the alley and driveway.

A gasolene motor pumping engine of 1,500 gallons per minute capacity is to be installed at the station, with a crew of ten men; a 65-foot auto-propelled water tower, with four men; a gasolene tractor-propelled aerial hook and ladder truck, with 85-foot aerial ladder and a crew of twelve men; and a gasolene chemical engine with double 65-gallon tanks and a crew of four men.

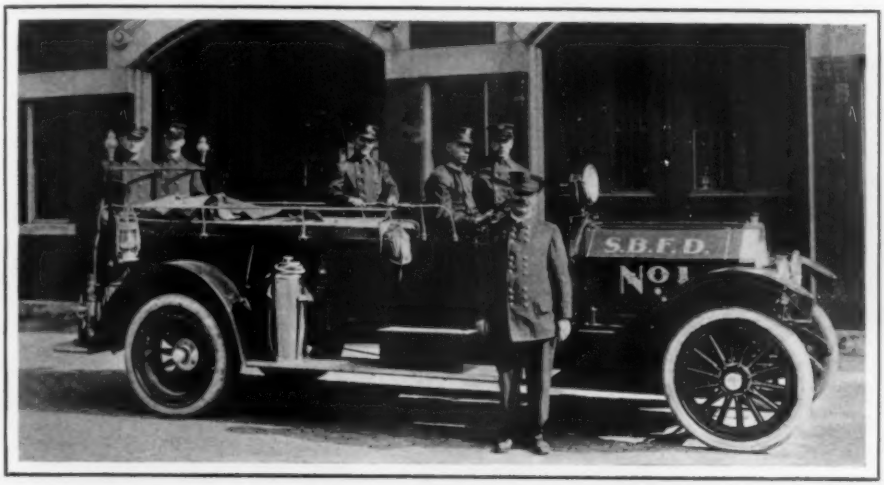
New Orleans Welcomes the International Association of Fire Engineers

IN the limited amount of space which the daily newspapers have been giving to subjects other than the European war, room has been found for numerous items regarding a few cases of bubonic plague, discovered some weeks ago in the city of New Orleans. As a result, uncertainty as to the advisability of visiting that city has been felt by fire chiefs and others desirous of attending the convention of the International Association of Fire Engineers, October 20-23. It is a pleasure to report that the latest advices show that such uncertainty need no longer exist. In a telegram to Secretary McFall, of the Association, dated September 12, 1914, Mayor Martin Behrman says: "Happy to tell you not a case of plague in New Orleans to-day."

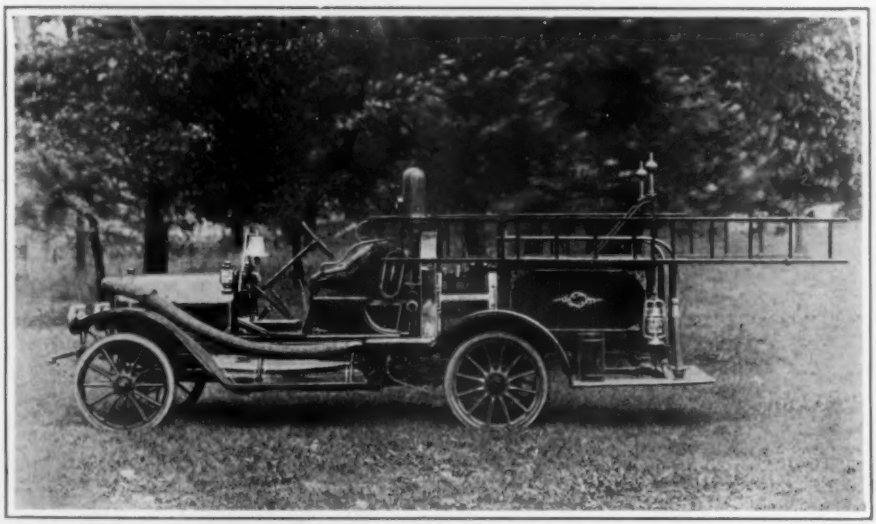
The unhappy expression on the countenance of the bubonic plague germ, in the accompanying cartoon, is, therefore, fully justified by the facts.

Motor Fire Equipment for City, Town and County

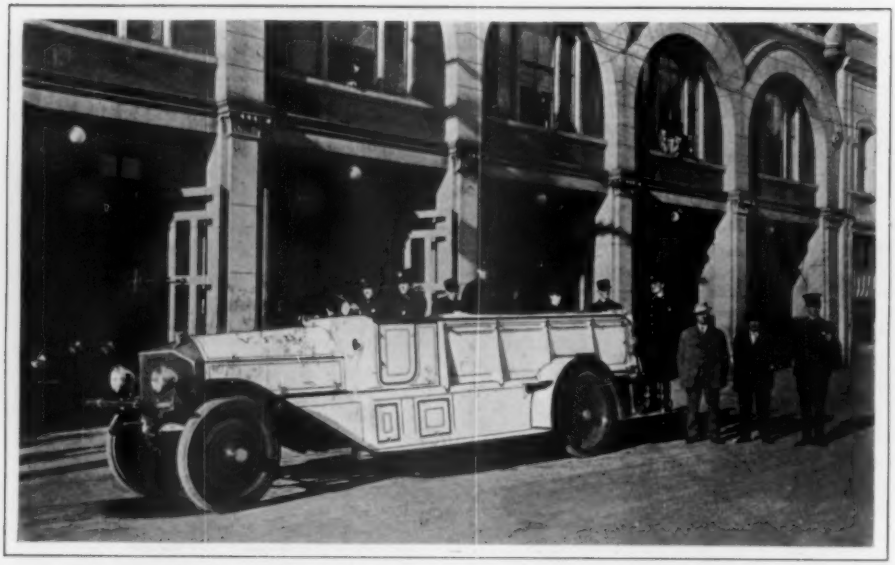
On this and the next two pages are illustrated six types of automobile fire apparatus in use by municipal and county fire departments



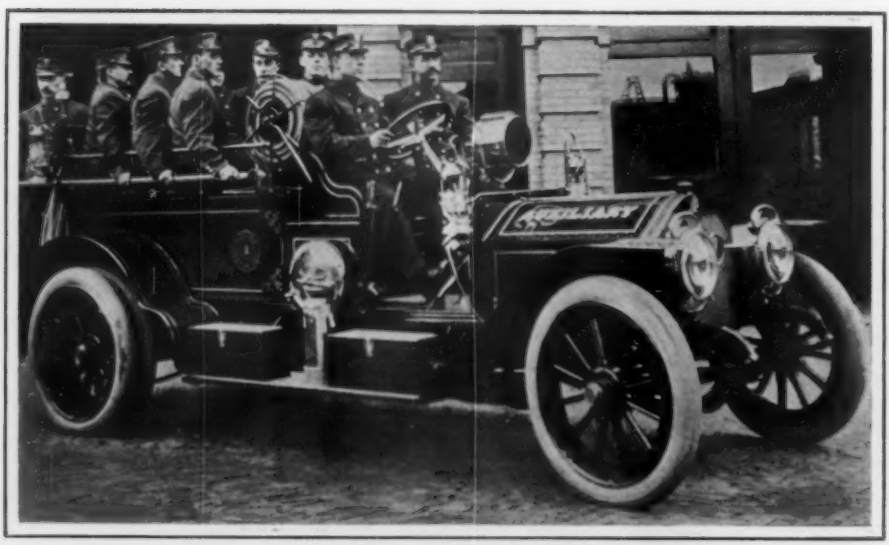
SOUTH BEND, IND., HOSE WAGON NO. 1



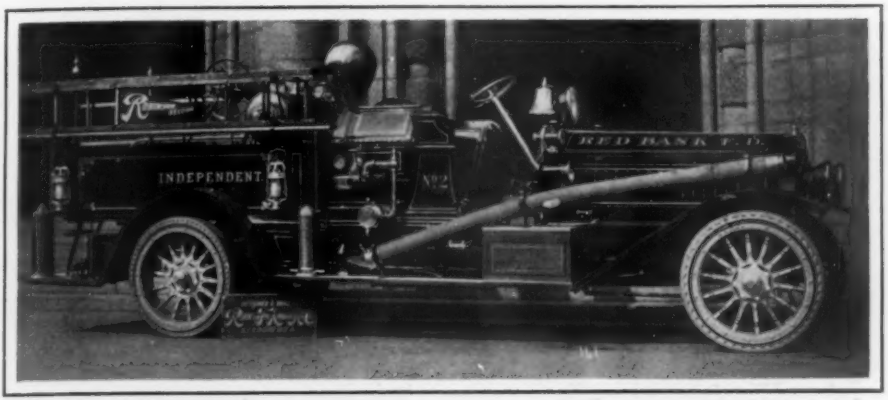
NEW TYPE HOWE COMBINATION HOSE WAGON AND PUMPING ENGINE



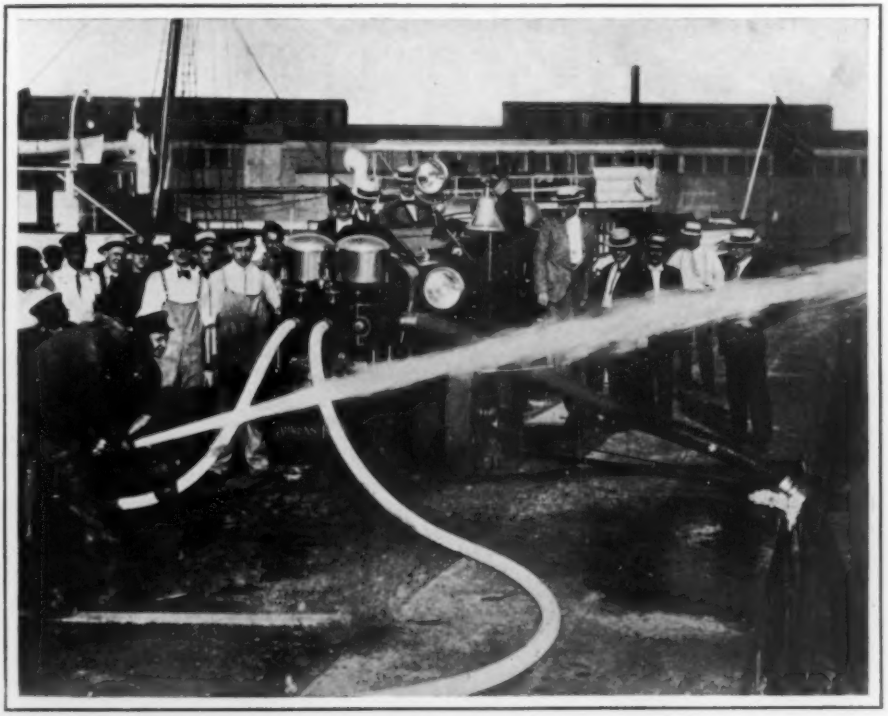
NOTT MOTOR HOSE WAGON RECENTLY DELIVERED TO THE CITY OF VICTORIA, B. C.



AMERICAN LA-FRANCE COMBINATION CHEMICAL AND HOSE MOTOR CAR, BATTLE CREEK, MICH.



ROBINSON TRIPLE COMBINATION PUMPING ENGINE IN SERVICE AT RED BANK, N. J.



AHRENS-FOX TRIPLE COMBINATION FIRE ENGINE IN OPERATION
This engine has recently been bought for Baltimore County, Md.

A FORESTER'S HOUSE IN THE SIHWALD, CITY FOREST OF ZURICH, SWITZERLAND

Town Forests—a European Idea by Which America Might Profit

By Harris A. Reynolds
Secretary, Massachusetts Forestry Association

WHENEVER we speak of "town forests" we naturally think of Germany, where such forests have generally been most highly developed. Notwithstanding its autocratic form of government, Germany has in the town or communal forest an enterprise which is thoroughly democratic. The town forest belongs to the people, and the profits therefrom go into the common treasury.

Before discussing these forests we should show how they were acquired. To determine this is not always easy, because many of them were owned by the people as far back as the twelfth and thirteenth centuries, and few definite records were kept in the beginning.

As a general thing most of these forests were obtained in one of four ways:

1. The feudal lords originally controlled the forest lands, and certain rights to the use of the forests were granted to the people by these masters, which rights resulted in public ownership when the lords were deposed or destroyed.

2. The monasteries and convents owned large tracts of woodland which were confiscated by the local governments during religious upheavals.

3. Wealthy members of the aristocracy in more modern times made gifts to the people of extensive forest areas, which became town forests.

4. The lands were bought by the towns and paid for by direct taxation.

These forests differ widely in many respects, depending on the ideas of the forester in charge, the soil and the topography. Different systems of regeneration and of cutting are adopted to meet local conditions. A description of one of these forests, which has reached a fine state of development, will give some conception of what the typical forest is aiming to become. The forest of Forbach is one of the best, though many compare favorably with it.

The Forest of Forbach

Forbach is a town of 1,900 people, situated in the Black Forest region in the state of Baden. It has a town forest of 1,482 acres, or about four-fifths of an acre per inhabitant. It is a clean, neat and industrious town, located on a small stream among the high hills. Everybody seems contented and happy. A large per cent of the people work in the forest all the year, or farm their little patches in the summer and work in the forest in the winter. Others are employed in wood-working industries. The profits of the town forest pay all the communal taxes. A section of the forest is set aside as a reserve, which is used to meet extraordinary expenditures. When a new school house, a town hall, or a street is to be built, they simply cut enough timber from the reserve section of the forest to meet the cost. This reserve forest takes the place of bonds or sinking funds used by municipalities in this country.

With a net profit of $12.14 per acre annually, it is not difficult to see how such a constant income can supply a small town. Beside the fact that the people have no local taxes to pay, an income is received by certain citizens from the profits of the forest. A peculiar custom prevails there, as elsewhere, by which the heads of old families receive certain benefits each year. In this town there are 250 such families, each of which is paid $36 yearly out of the profits of the forest. When one of these families dies off or leaves the town, the next citizen, oldest in age of residence, comes in for this inheritance. This privilege descends from father to son, however, and is the means of bringing many young men back to the village. One must live in the town in order to enjoy these benefits. In some places these old residents receive a cord of firewood each year. Such is the case in the city of Baden-Baden.

The only interference in the management of town forests made by the state is the requirement that all towns must have a trained forester appointed by the state to superintend the forest. This is not a disadvantage, because these men must practically give their lives to the study and practice of forestry, and good results are obtained by them, as is shown by the following table. These are some of the best forests, but of all those visited by the writer, the average net profit per acre annually was $6.20:

Town or City	Area in Acres	Annual Net Profit Per Acre
Baden-Baden ...	12,849	$5.25
Forbach	1,482	12.14
Frankfort	11,224	4.93
Heidelberg	890	1.70
Pforzheim	2,640	9.60
Zurich	4,448	7.20

AN EXAMPLE OF NATURAL REGENERATION IN THE HILLY FOREST OF FORBACH, GERMANY

Protection Against Insects, Animals and Fire

A lesson which Americans can learn from the management of these forests is the almost perfect protection given them against insects, animals and fire. The insect problem, which is becoming serious in parts of this country, is met in most of those forests by the protection and care of insectivorous birds. Much money is spent in putting up nesting boxes. Food is furnished them in winter, and bird baths—shallow basins made of concrete—are kept supplied with fresh water. In some of the forests special breeding plantations are made of dense shrubs. These also give a cover to the small birds and protect them from other birds of prey.

Deer are very plentiful in the forests, and plantations of coniferous trees are damaged by them. In the winter when food is scarce, they nip off the leaders of the young trees. To prevent this, a touch of coal tar is put on the top of each little tree, and sometimes a small bunch of hemp is stuck on the end of the leader. This sticks to the tree until it grows out of reach of the deer. The hemp evidently gets tangled about their teeth.

The fire menace, which is so hazardous in this country, is almost eliminated from those forests: There is little chance for a fire to start, because all dead limbs and slash resulting from cutting are disposed of. No deadwood is allowed to remain in the forests. The poor people are permitted to go through the forests and gather up all the fagots which fall from the trees. Women and children carry huge bundles of dead limbs home for firewood. Forest rangers are constantly guarding the forest. Each is assigned from 300 to 500 acres. These men are not trained technically, but are field assistants to the head forester. Good roads intersect the forests and these also serve as fire lines. A forest fire is almost a curiosity. The fire risk is so small that in Bavaria the state bank will insure these forests against fire.

The methods of lumbering used in the German town forests differ widely from those of the United States. The trees are cut and trimmed, and the stems are taken out whole instead of cutting them into different lengths, as we do. It is not unusual to see a stem 125 to 135 feet long being hauled to the mill on wagons. That is one reason for the good roads which are maintained all through the forests. The forester superintends the cutting and dragging of the logs to the roadside. Here they are sold at auction and the purchaser must haul them away. The cutting itself is done by contract, at so much per cubic meter. Men organize themselves into gangs under a foreman, who keeps the time of the men and collects the wages from the town.

Many women are employed in the forests to do weeding and hoeing. Much of this work is required in the nurseries and new plantations. The pay which they receive ranges from 30 to 48 cents per day of ten hours. The men receive from 72 cents to $1.25 a day. For that reason, it may be thought that town forests in this country could not be profitable, but American foresters who have studied the problem say that the cost of getting timber to the mill is no greater in this country than in Germany, because of our improved methods of transportation. In this country we build tram roads to take out timber, while the Germans still haul much of theirs out on road wagons.

True Conservation

A pleasing thing about the town forests, especially in the hill country, is that they cover land which would otherwise be lying waste. Sand plains and steep slopes will be found growing excellent trees where nothing else could be raised with a profit. This means that true conservation is being practiced, and that the soil is being utilized to the best advantage. Of course, in some of the older forests, you will find flat land that would produce agricultural crops, but this is because the forests have been owned for centuries by the town.

The necessity for timber and fuel is recognized, and towns are buying lands and putting them under forests to-day. Nor is it always the cheapest land that is bought for this purpose. The city of Zurich, Switzerland, recently bought a large tract for a town forest for which it paid from $80 to $120 per acre. If it is profitable for European towns and cities to have their town forests, why won't it pay American cities? Almost any city or town in this country which lies in a hilly district can find plenty of land which can be obtained at a low price, and can be converted into a profit-producing forest for future generations.

It goes without saying that these large forest areas improve the living conditions about a town. They protect the water supply, cool the atmosphere near them, and often act as wind breaks to the towns themselves. The air from a forest is pure, because the trees live by taking up the carbon dioxide from the air and in turn give off oxygen. The latter is a food for man, the former a poison. For that reason alone a forest near a town is a great factor in preserving a healthful condition, and as a recreational area the forest has no peer.

Recreational Advantages

The recreational phase of the German town forest is perhaps even more important to the people than the fact that it is profitable commercially. It is the lungs of the city or town. Thousands of people go into the forest for rest and refreshment. One can generally go from the heart of the city to the forest for 10 pfennigs, or 2.4 cents. Hence the forest is accessible to the poor who cannot go long distances for recreation. On Sundays and holidays the forest is full of merrymakers, factory workers, shop girls, mothers and babies, and everybody is having a good time. Families take their luncheon and go into the forest for the whole day. As a genuine outing could anything be more refreshing?

All through the forests are to be found refreshment inns. Seats and pergolas are plentiful, and even water-fountains are maintained in some of the forests. Occasionally a monument will be built in the forest, and large old trees are often dedicated to famous statesmen. For instance, the Bismarck Oak in the town forest of Darmstadt is one of the largest of its kind in the Empire. The forest is generally more popular than the formal city park. This is probably because it is cooler and more refreshing. In some sections the school children are given a half holiday on Wednesday and Saturday afternoons and are taken into the forest for play. This practice probably has much to do toward engendering in the children a love for their forest, which remains with them in later years.

A Profitable Community Investment

To sum up the advantages of the German town forest, we are safe in saying that it is a profitable investment. Cities are able to greatly reduce the tax rate, while small towns can wipe out their taxes entirely by a well-developed forest. The city of Frankfort-on-the-Main requires the forest to produce $25,000 each year for the city treasury. The forest furnishes steady employment to many of the citizens and temporary work for others. Wood-using industries are attracted to the town, which employ more men. Protection is given to the water supply, floods are less severe, and the forest makes the entire surroundings more healthful and more beautiful. As a field for recreation, there is nothing to compare with it, taken the year round. It enables the community to utilize every foot of soil and thereby to practice conservation to the benefit of all the people.

HAULING BIG LOGS FROM A GERMAN TOWN FOREST

It is certain that a community which starts a town forest will not be making a mistake. The generation which begins it will not reap the harvest, but its children and grandchildren will. Once such a forest is established, it will continue to be a source of joy and profit for centuries under wise and scientific management. In the United States there are to-day millions of acres of land lying within easy reach of

cities and towns which are producing nothing; much of it is simply being washed away. This land is so poor or so situated that it will grow no other crop, and yet if trees were planted on it, it would soon produce valuable timber. On much of this land fine trees have grown in the past, and it will again produce a crop if given a chance. The individual will not reforest this land, because he can never expect to get his money back; he can't wait for a crop. But a city or town can afford to reclaim this land and wait for a return.

The United States government and many of our states are buying up waste land in large areas and are putting it under forest. The city or town can do the same thing on a smaller scale. With a little work by public-spirited men and women and at a small expense, a town forest can be started which will be an example of conservation to the people—a source of constant profit in the future. In a very few years, if properly managed, it will become a wild park, where people may enjoy themselves without having to travel miles to find a stretch of woodland. Even to-day it is becoming increasingly difficult to find a woodland near some towns and cities. The far-sighted citizen who thinks about the future of his town cannot overlook the advantages to future generations that will come from a town forest, nor the opportunities of the present to provide such a forest.

A Contest in the Establishment of Town Forests

THE cities and towns of Massachusetts have an opportunity to enter a novel contest. Nearly sixty of them are already entered in a Shade Tree Planting Contest, promoted by the Massachusetts Forestry Association. The prize in that case is a mile of street planted to shade trees by the Association.

The Town Forest Contest is more unique and far-reaching in the object to be accomplished. Under the new Town Forest Law recently passed in Massachusetts, cities and towns may own and operate forests of their own. It is to encourage the movement in this direction that the Massachusetts Forestry Association is offering to plant 60,000 three-year-old white pine transplants on fifty acres of the land acquired for the town forest, of the city or town that wins the prize. The young trees will be spaced six feet apart over the entire fifty acres.

In order to enter the contest, a municipality must own and set aside at least 100 acres, under the new Town Forest Law, and fifty acres of that area must be planted to forest trees. In Massachusetts the white pine is the best commercial species, and most of the places entering the contest will plant white pine.

A committee appointed by the Association to judge the contest will visit all the forests. It will determine the standing of the contestants on the area acquired, the amount of planting done, the quality of the trees planted, extension provisions, advantages for lumbering, and water and soil protection, fire protection, recreation and esthetic possibilities, and general improvements. Appropriate scores are allowed on each point. As a result of the requirements, the city or town having the best possibilities for a permanent and efficient town forest wins the prize. At least ten entries must be made before the prize will be awarded. The contest opened June 1, 1914, and will close June 1, 1915. This will allow for both fall and spring planting.

When we consider the splendid advantages which a town forest will bring to a city or town, and the small outlay required to start such a forest and to maintain it, we should expect to hear of many places entering this public-spirited contest. They have nothing to lose and much to gain.

Many places already own considerable areas on their watersheds to protect their drinking water from pollution. They could do nothing better than to plant these areas to trees. Besides getting the best protection for their water supply, they will be growing a crop of timber. It is to be hoped that many cities and towns will avail themselves of this opportunity to beautify their surroundings and conserve their resources. Is not the idea worth carrying out in other states also?

Lessons for America from Street Paving Methods in European Cities*

By George W. Tillson

Consulting Engineer, Borough of Brooklyn, N. Y.

THE general condition of the pavements in European city streets is better than that of the streets of America. As a rule all pavements are good for each particular kind. If the pavement is old stone block, its surface is good, and the same is true of macadam, showing plainly the attention given to proper repairs. Of the cities visited, Berlin has the best pavements, and they are kept in the best condition.

There are several reasons for the condition of streets being better in Europe than in America. As a rule, a good new pavement in this country is practically as good as that in Europe, and the wood pavements are undoubtedly better. It must be admitted, however, that in Europe more care is taken in the construction and more attention given to details, and after the work is completed repairs are more promptly made.

Officials in Europe recognize the fact that openings in pavements are very detrimental, and everything possible is done to reduce these openings to a minimum. For instance, wherever possible, subsurface work is laid in the sidewalk area, and, as in the case of Westminster, connections are made directly from the sewer to the property. Manholes are so constructed as to present as little obstruction to the street surface as possible, and, again, as in the case of Westminster, the property owners and corporations are notified long in advance as to when and with what materials the streets are to be paved.

Although specifications in all European cities are less rigid, more indefinite and capable of wider variation in work than those in this country, it must be admitted that the results were uniformly good, the contractors evidently having moral obligations to do good work.

The amount of money spent for repairs to pavements seemed in all cities except Paris to be remarkably small. This is undoubtedly due, to a certain extent, to the lower rate of wages and the lower cost of material. For instance, in Liverpool men at work on the tar-macadam streets make $6 per week, and the stone pavers $12. Taking all things into consideration, however, it would seem that first-class results were obtained for the money spent.

Another reason, possibly, for the efficient work are the small units of the municipal corporations. Of all the cities visited, Vienna was the only one that contained a greater area than the Borough of Brooklyn, and none of the others, except Glasgow, contained half as much. It might be said that with the smaller units work should cost more. Possibly this would be true as a general proposition, but with the smaller units the head of a department has a greater opportunity of giving individual attention to the work going on and consequently can often get more satisfactory and more efficient results.

Suggestions

As it has been admitted that the best pavements of the United States when laid are as good as those of Europe, and that practically the same materials are used, it might be pertinent to suggest methods of procedure in this country so that the condition of its streets would be improved, and the following are offered:

1. *Standard first-class paving material only should be used, and the proper material selected for each street.*

This suggestion is generally carried out at the present time, except that it does not seem that sufficient care is given to the selection of the right material for any particular street. This is extremely important, and it is only within the last few years that it has had any careful or systematic attention.

2. *Work should be done carefully, with especial care for small details.*

As a whole, the above has not received proper attention in this country. Where a great amount of work is done of any particular kind, it is apt to be carried out in a

* From the conclusions in the author's recently published report to the President of the Borough of Brooklyn, as a result of an examination of city streets and pavements in London, Westminster, Liverpool, Glasgow, Edinburgh, Amsterdam, Brussels, Paris, Berlin, Munich and Vienna.

hurry, without attention being paid to the minor points. This often affects the durability and the appearance of the pavement.

3. *The funds for new pavements should be provided in advance, so that at least several months should intervene between the time when it was known what streets would be paved and the carrying out of the work, and an attempt should be made in each case to determine when the work was to be ordered and just when it should be carried out on each particular street.*

If this were done, corporations and individuals could make definite plans for repairs to any subsurface work that might exist in the streets, and also provide for new construction if any were necessary. It must be admitted, however, that in large cities, where a great amount of work is to be done and where it is necessary to let work to the lowest responsible bidder, it would be difficult to determine this in every case. It would, too, be more difficult in the case of new work than in repaving, as when new work is ordered the demand for its immediate completion is very strong. At the present time the Board of Estimate and Apportionment of New York City will not permit an original pavement to be laid unless water, sewer and gas mains have first been constructed, but other subsurface work is often necessary. It is believed, however, that if an earnest attempt were made to determine some time in advance just when work should be done, it could be more nearly accomplished than would seem probable at first thought. The advantages of it, however, are so great that even a partial success would be worth much more than it would cost.

4. *The number of openings in the pavement should be reduced to a minimum.*

The remarks made on the former paragraph apply to a certain extent to this. The discussion can be profitably carried farther, however. It must be admitted that with the different kinds of subsurface work in the streets of this country, and nearly all being in the roadway, with the general changes that are taking place in the character of business along the streets, many openings in the pavements are necessary. This being the case, it becomes all the more important to reduce this number to a minimum. The problem, however, is not easy of solution. If, in addition to the precautions suggested in the previous paragraph, all corporations and property owners were convinced that after a street is once paved it cannot be opened, except where absolutely necessary, and that no new construction would be permitted for a term of years, a great gain would be accomplished. When mains are laid in the street, openings must be made for their repair, but if, previous to the construction of the pavement, and as is generally done at the present time, corporations put all of their subsurface structures in good repair, there should not be the necessity to make openings for some time to come. Emergencies, however, will arise when openings must be made, and that condition must be accepted.

The problem now in the built-up sections of New York is to take care in the best possible manner of what structures are there, but the city is growing rapidly towards the outside, and in the residential and suburban districts now being built up it is possible to arrange so that future repairs and installation of work can be made without disturbing the roadway pavement. The most of the streets of the city in the residential districts are 60 feet wide, with a roadway of 30 feet. This leaves 15 feet for sidewalk space on each side, where, unless the property is built up solidly, a 5-foot walk only is laid. This gives ample space for all subsurface work, except water, sewers and gas mains. And even if the street is solidly built up and the sidewalk space paved for its full width, these subsurface mains could still be laid without much inconvenience. It would require, it is true, a set of mains on each side of the street, but the reduction in the length of service lines would be such that the expense as a whole would probably be not much greater. In any event, the advantage gained by not having the roadway pavement opened for service connections would more than compensate for the extra expense.

The street belongs to the city for its entire width, from property line to property line, and its entire width should be used to the best advantage and not the roadway only.

In the business part of the city, as in the residential part, where the streets are at present solidly built up, subsurface work is constructed in the roadway. At the present time, in order to get connection to private property, it is necessary to dig up the pavement.

It must be admitted that it is a proper requirement in our crowded cities to have everything underground that it is possible to place there, but it does seem as if the telephone and electric light companies could work out a scheme by which possibly one connection could be made with the main in the street for each block and subsidiary connections made to this sub-main by property owners in the block without tearing up the roadway pavement.

5. *The surface of the pavement should be broken by any foreign construction as little as possible.*

Street car tracks are necessary, but they should be built in such a way as to conform as nearly as possible to the surface of the street and so that the pavement can be easily maintained adjacent to them. Manhole heads also tend to vary the surface of the pavement, and while, with the present construction of the underground system, they are necessary, they should be as few as possible and built with the utmost care. This fact is recognized abroad, where manhole heads are much less frequent on the streets than in this country, and in Paris almost none were seen on the streets. In Glasgow and Edinburgh structures to take the place of electrical manholes in the streets were erected on the sidewalk. It is a well-established fact that a pavement, of whatever character, will last longer if it is kept smooth and even, so that the wear comes directly upon the top of the pavement. This is especially true of any block pavement, but it is also true to a certain extent even on sheet pavements.

6. *Repairs should be made promptly and in a first-class manner.*

Repairs to American pavements are due to a very large extent to the openings made for subsurface work. While it has been admitted that these are necessary to a great extent, it is possible to reduce the damage caused by them to a minimum by making prompt and efficient repairs. The earth should be replaced solidly and compactly, so that there should be no further settlement, and the concrete should be allowed to set before the wearing surface is laid. If on a street where the traffic is as dense and heavy as it is on the Strand, Westminster, concrete can be allowed to set for seven days without occasioning inconvenience, it certainly can in every city of this country, with the exception possibly of a very few streets.

It is extremely important that the foundation of a cut be such that it will not settle, so that the pavement can be relaid to the same surface as the adjacent pavement, with no chance of settlement. It is often the practice to lay pavement over cuts a little above the old pavement, so as to allow for settlement. This is not good practice, as the pavement gets undue wear before the expected settlement takes place, and then if it is not exactly what was expected, either a hump or a depression is left in the surface. General wear and tear repairs should be made whenever and wherever required. By attending to this work promptly, the pavements can always be kept in good condition. It may take at first more money than most cities appropriate for maintenance, but if this were done thoroughly for a few years, the total cost would be materially decreased.

7. *The city officials and those of the street car companies should work harmoniously, so that railroad work will be done properly and permanent repairs or necessary reconstruction made at the time the streets are paved.*

That a great demand has arisen for better street pavements in the last five or ten years must be admitted. The street car companies also have accepted this fact and are in most cases doing their best to meet the demand. These corporations are, however, hampered by lack of funds, even as municipalities and private citizens are, but it can safely be said that they recognize the necessity of good construction and that generally they are working to the same ends as the municipalities are.

It must also be admitted that the cities themselves have met the demand for better pavements to a great degree; that the pavements of the cities of this country are vastly superior to what they were twenty or even ten years ago, and that after the old pavements in these cities have been replaced with the pavements constructed of modern materials the streets themselves will cost very materially less for maintenance, so that if the good work goes on for ten or fifteen years more the streets of America will compare favorably with those of any foreign country.

Expert Advice a Real Economy

To the Editors of THE AMERICAN CITY:

Your editorial on "Expert Advice" in your issue of July, 1914, and the letter of Mr. John M. Goodell commenting on the same, in your August number, were of great interest to me.

Mr. Goodell's first comment emphasizes the value of real expert advice to industrial, as well as to municipal, corporations, while at the same time his citations show how widespread at present is the very error mentioned in your editorial—i. e., the tendency to procrastinate in "calling in the doctor." I imagine one effort of your editorial was toward correcting this tendency to rely on home-made remedies and household skill too long, and, to my mind, this point should be hammered in and driven home. The opening paragraph of your editorial, if not its opening sentence, contains the crux of the matter.

Mr. Goodell's second comment, on the failure to appreciate and follow good advice, is justified by facts only too frequently occurring. Perhaps a horse cannot always be made to drink the water he is led to. Sometimes the horse sense must finally be admitted to be the best; but, unless it is justified, the mere refusal to drink may often be overcome by various methods. Publicity of the facts is one way frequently successful, and it may also determine the propriety of the advice or of the reasons for refusing to accept and use it.

Mr. Goodell's third comment, in a way at least, emphasizes again the value of *competent* expert advice, and it is worth while now to call attention often to the fact that "there are doctors and doctors." Until some provisions shall be made to prevent the imposition on the public of improper and worthless advice, by the establishment of standards for screening out the chaff "experts" from the grain, probably the "cut and try" methods are the only ones available. The inefficiency of such methods should, however, be generally emphasized and understood, in order that better ones may be soon devised and the ground for the objections mentioned by Mr. Goodell removed as promptly as possible.

I hardly believe that Mr. Goodell desired to point out anything more than the exception to the rule, and I trust that in his long experience he has not found many instances such as he cites, as to worthlessness of advice paid for.

In my experiences, the reasons for the non-employment of competent experts in corporate undertakings have been usually one or more of the following:

1. The failure of the local authorities to appreciate the importance of the problems to be considered, the variety of possible solutions, and the relative value of these solutions.

2. The failure of the local officials or engineers in charge to admit, privately or publicly, that their ability to determine the solution of the problems may be enhanced by the advice of well-trained and even more experienced outsiders.

3. The failure of the local officials or engineers to determine the question of securing expert advice purely on a basis of efficiency and economy of results, rather than on bases of personal pride, prejudice, desires for personal experiment and personal notoriety.

4. The failure of the local authorities to appreciate the difference in value between that of the advice of the independent expert and that of the advice of a prejudiced or interested-in-the-material-or-work expert.

5. The failure of the local authorities to distinguish between the competency, in any particular matter, of experts in various specialties or lines of engineering.

6. The failure of authorities and public to appreciate, estimate, or measure the value of services properly rendered by competent experts.

7. The failure to eliminate sufficiently purely political considerations.

8. The failure of municipalities to understand the frequency with which industrial corporations do employ experts to the advantage of the corporations, and to appreciate that the same advantages may be had by municipal corporations.

9. The failure, occasionally, in having the value of competent expert advice, secured

and paid for, properly demonstrated by following it.

10. The failure of some corporations to appreciate that, because on one occasion the employment of a so-called expert proved unprofitable, such instances are in the minority.

11. The failure of society and the engineering profession to protect both society and the profession properly as yet against the "quack."

12. The failure of many competent experts to so express themselves in their advice and reports as to leave themselves free from grounds for such criticism as Mr. Goodell makes on this point.

I take it that your editorial and Mr. Goodell's letter were published with the idea of warning against and, so far as possible, of preventing such failures. I think they deserve emphasis; hence this letter.

Baltimore, Md. W. W. CROSBY.

American Rock Asphalt

By T. Hugh Boorman, C. E.
Highway Engineer, New York City

THE question of the practicability of the use of American rock asphalt has become a more interesting one now that, owing to the war, shipments from the European sources of supply of the natural bituminous limestone must be curtailed or cut off. The use of the natural bituminous limestone of Seyssel and Mons (France), Val de Travers (Switzerland), Limmer and Vorvohle (Germany) and Ragusa (Sicily) has been more or less general in the United States since 1872. The area of streets covered, however, has not been very large, owing to the high cost of freighting the entire volume of the surface material for so many thousand miles, and it has been laid almost entirely at seaboard cities, such as New York, Brooklyn, Philadelphia, Boston, New Haven and New Orleans.

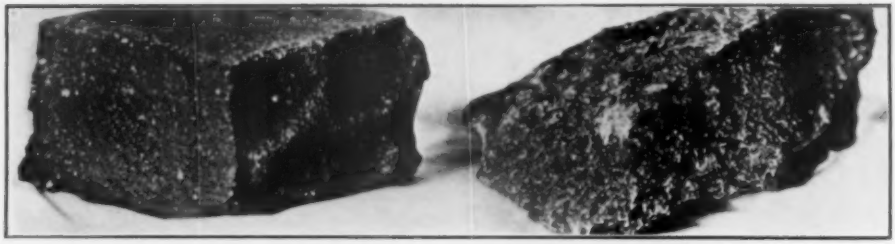
That the natural material gives a more durable finished surface than the asphaltic cement sand or concrete mixtures has been conclusively proved by the extraordinary low cost of maintenance where any care has been exercised in watching and promptly repairing any defects, which have rarely, if ever, been caused by ordinary traffic. In this country we have two natural asphalt rock asphalts—the limestone and the sandstone. The former is found principally in Texas and Oklahoma and the latter in Kentucky, with a less compact and more oily product in California.

The principal supply of the Texas rock asphalt is from Cline, Uvalde County. The use of this material for street surfacing was begun in San Antonio and other Texas cities during the first year of this century. While the results in general were satisfactory, it was found that there was a lack of ductility in the surface that occasionally caused cracks in places where traffic was light or expansion and contraction had been severe.

After scientific and careful research and experimental work, it was discovered that an improvement could be made in preparing the material for application to the streets, and the writer was last June summoned to Texas to report on the new method.

Investigation showed that an addition of a small percentage of maltha (asphalt oil) gave a ductility to the asphaltic cement which not only afforded an added resilience and ductility to the surface mixture, but allowed of a denser and more compact mixture which permitted a greater comparison than with any artificial mixture of asphaltic cement, sand and lime dust under steam roller pressure.

The new method of preparing the material for application to the street surface is a most decided improvement on the European method. In Europe no attempt has been made to improve on nature, and the only deviation from the direct application of the heated powdered asphalt rock has been the use of rock from different mines, such as Seyssel and Ragusa, Neuchâtel and Vorvohle, or other mine prod-



A PIECE OF TWO-INCH PAVEMENT A BIT OF THE NATURAL ASPHALT

ucts where one limestone is more or less impregnated with bitumen or the material more or less porous in the natural state. By this method a rich and lean impregnation when mixed together will give the necessary 7 per cent to 10 per cent of bitumen which is required. With the Texas preparation, a better bituminous mixture is obtained and a more regular percentage of bitumen.

The advantages of the fluxed material over the natural material as laid in the beginning of the century in Texas cities is that a ductility is given to the present surface which was wanting in the old construction, owing to the asphaltine in the natural rock being harder. The bitumen in its original formation had undoubtedly been subjected to greater heat and the lighter petroleum evaporated by nature; therefore the new idea of adding maltha (asphalt oil) to the natural asphalt in the limestone gives a natural asphaltic cement with more elasticity or ductility.

Under the new method some three hundred thousand yards have been or are being laid in Houston, Beaumont, San Antonio and other Texas cities. How great an influence in paving this improved method of waterproof surfacing of streets and roads will have on city authorities in other states is largely a question of cost of transportation.

For country roads the Uvalde natural

ROCK ASPHALT PAVEMENT ON CAPITOL AVENUE, HOUSTON, TEXAS

rock can be applied either hot or cold on a macadam road with a thickness less than that required for city streets. Highly satisfactory results are reported from city engineers of three-fourth-inch surface rolled in by the penetration method, with a final coat one-half inch thick where Kentucky rock has been used. For such work the powdered asphalt limestone will be found more efficacious than the asphalt sandstone.

On the Certification of Municipal Bonds

By Park Terrell

ONE of the leading trust companies of this city making a specialty of certifying to the genuineness of municipal bonds sends out literature on the subject under the caption "Safety Is the First Requisite in the Issue of Municipal Bonds," and lays particular emphasis on the necessity for issuing securities for the payment of which taxpayers are responsible, under a plan of issue providing adequate protection to the issuing community, the dealer, the banker loaning on the bonds as collateral, and the investor, who, in this instance, is the "ultimate consumer." The cry of "safety first" is perhaps nowhere more justified than in this connection, since the ordinary loose way of issuing this class of securities lends itself to all sorts of abuses and may justly be termed an open invitation to crime, so easily may spurious paper be issued and the fraudulent act remain hidden for months. Often the municipality itself invites trouble by requiring in its published notices of sale that the blanks be furnished by the purchaser of the bonds. So easy a method of obtaining money is not to be overlooked by the unscrupulous, and duplicate issues are the result. It is to be hoped that every crime of this sort is finally brought to light and the perpetrator punished, but in spite of the popular theory that the criminal eventually reveals himself, there remains an uneasy doubt as to whether he may not sometimes successfully cover up all evidence of his wrong-doing and out of the earnings of his illicit capital repay the "loans" obtained by means of the duplicated paper.

We have pointed out only one of many routes by which lax methods of issue invite abuses. The fact that such lax methods prevail hinders in no small degree the free exchange of municipal securities between investors, and in other ways unfavorably affects the value of securities which should stand supreme at the very top of the market and pass unquestioned from one investor to another.

It seems strange that the officials of any municipality should hesitate to adopt measures to safeguard the interests of taxpayers, but "penny wise and pound foolish" is the prevailing policy, and, as our forefathers did so do we, though financial methods and conditions have entirely changed. Frequently when an issue of bonds is proposed and the question of having it "certified" is under consideration, a local financial institution will offer to place its signature on the back of the bonds attesting their genuineness, and the argument is advanced that public officials should patronize home industries, etc. On the other hand the trust company which has been most active in directing attention to the need for better methods in the issue of all public obligations insists that "the value of certification lies in the safeguards it attests" and that the mere writing of another name on a bond in no way protects against either over-issues or forgery.

This trust company has backed up the foregoing statement by establishing a protective method for the issue of bonds composed of a rigid system of safeguards, yet so directed as to materially assist municipal officials in the performance of a most difficult duty, relieving them of responsibility and serving their convenience. The method not only protects the investor, but renders a much greater service in safeguarding the interests of the taxpayers—which, of course, should be the chief consideration of officials responsible for the proper issue of bonds.

At various times state authorities have

endeavored to provide official supervision intended to protect bond issues, but so far none of these state-directed plans have been wholly satisfactory, and municipalities situated in states adopting such procedure have had their bonds issued under trust company certification methods in addition to the *modus operandi* provided by the state.

It is unfortunate that municipal officials usually remain in office only for short terms, and therefore cannot familiarize themselves with the technical details of matters, such as bond issues, which may come up only once or twice during their terms of office. It is encouraging, however, to note that the more experienced officials tend to the employment of safer methods for the issue of their bonds, many cities having adopted the plan of having their bonds certified by trust companies providing effective safeguards covering the process of preparation and issue.

The Lighting of Our Porches

By A. L. Powell

CIVIC pride in our modern towns is beginning to show itself in many forms, among which not the least important is a higher standard of illumination. The stores are more brightly lighted than in times past, and the various "White-way" campaigns have improved, to a marked degree, the appearance of the streets.

Along this line, it is only natural that the standard of residence lighting should be raised. As the porch is the part of the house which is most visible from the street, the illuminated porch is an indication that the owner is doing his share, in one respect at least, toward the general attractiveness of the town. Not only is good porch lighting attractive, but it has an element of protection. Burglars and sneak thieves are more likely to pass by a house that has a porch light burning than one that has not.

Most of the advances in the art of illumination have been due to an increase in efficiency of the light sources themselves. This, however, has been paralleled by improvements in the reflectors and other auxiliaries. These changes have made good porch lighting more feasible than ever before, and have placed it within the reach of everyone, no matter how simple his home.

The incandescent lamp is the most logical illuminant for this purpose. A few years ago the lamp most in use for porch lighting had a carbon filament; it consumed 30 or 50 watts of electrical energy, giving 8 to 16 candlepower, respectively. Now, however, we have available the 10-watt Mazda lamp, which gives 8 candle-power. This is

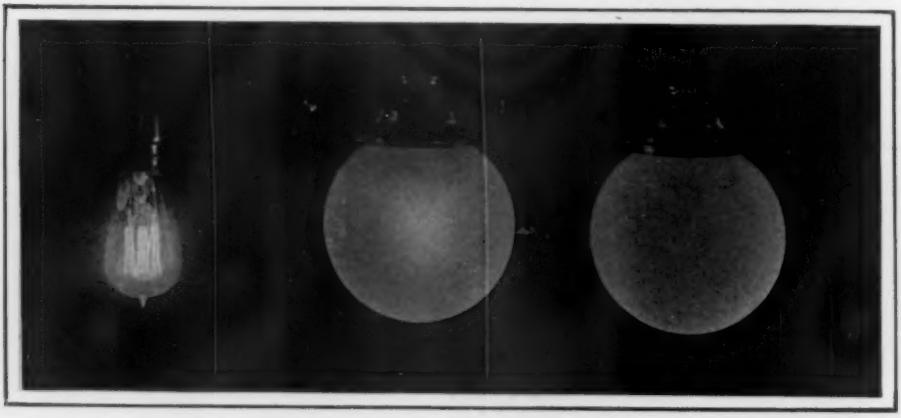


FIG. 1

adequate for lighting the average small porch. And think what that means! Assuming the cost of power to be 10 cents per kilowatt hour, this lamp costs but one-tenth of a cent per hour to operate. In other words, the porch can be lighted every night from seven to eleven o'clock for 12 cents per month.

Let us now see what comprises good porch lighting. Of course, some porches are fitted up as a room and used for playing cards or reading at night, in which case they should be lighted in the same manner as a room. Lamps of the size which would be used indoors and similar reflecting devices are applicable. If the ceiling is dark, direct lighting must be used; if light in color, semi-direct or totally indirect units give a very agreeable light and make a pleasing appearance.

The average small porch, however, requires but a very low intensity of general illumination, sufficient for a visitor to see clearly the bell and name-plate, and to be distinguished from within the entrance. The steps must be well lighted to avoid danger from accident. As stated above, it is desirable that the wattage or the size of the lamp should be very small, for it is advantageous to have the porch light burning all evening. For reading purposes, it is desirable to have a weatherproof flush receptacle provided in addition to the ceiling light, so that a portable lamp may be connected to the lighting circuit.

FIG. 2

FIG. 3

The logical location for the porch light is at the ceiling, either midway between the door and the steps, or, in some special instances, at the front, above the steps.

Formerly the standard equipment consisted of a metal ceiling ring, holding a clear spherical glass ball, etched on the inner surface. This globe absorbed a certain percentage of the light, depending on the depth of the etching, was not attractive, and lacked diffusion.

By diffusion we mean a breaking up or spreading of the light rays—a soft light in contrast to a glaring one. This is roughly shown in Fig. 1. At the left is a clear, bare lamp, the filament visible in its full brilliancy. At the center the lamp is inclosed in one of these roughed inside globes just described. Partial diffusion is produced.

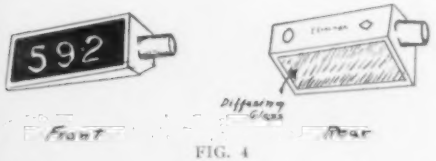


FIG. 4

While we cannot see the separate wires of the filament, the general location of the lamp is discernible and the entire ball not uniformly lighted. At the right is an opalescent or white glass ball, giving complete diffusion. The position of the lamp cannot be determined, and the entire ball is uni-

formly bright. This is certainly a more artistic arrangement.

A feature which is very noticeable in the average porch light is the collection of dirt and dead insects at the bottom of the globe. Fig. 2 shows a porch lighted by a 50-watt carbon lamp in a roughed-inside globe. Close inspection will reveal a dark spot at the bottom, due to this accumulation of dirt and insects. Not only is this untidy, but an illumination test made of this unit before and after cleaning showed an increase in illumination of 24 per cent with the clean globe.

The lamp in the previous picture was replaced by a 10-watt Mazda lamp, and the globe by an opalescent or white glass enclosing ball of an attractive design. This gave excellent diffusion, and the appearance of the unit is pleasing. The present illumination is approximately the same as from the old equipment when dirty, although only one-fifth of the power is used; it is about half the illumination from the old equipment when clean. It can be readily seen, however, that there is plenty of light.

One of the greatest inconveniences when calling at night in an unfamiliar locality is to locate the desired number. To meet the demand for an illuminated house number, a fitting has been devised of the type shown in Fig. 4. This consists of a cast iron body with a diffusing glass front and back, enclosing a standard lamp receptacle, and

FIG. 5

FIG. 6

has either a straight or a 90-degree angle swivel hub tapped to receive ½-inch conduit. The over-all length, exclusive of hub, is 8 inches; depth, 3½ inches. It will accommodate a 10-, 15- or 20-watt lamp. The front glass is blackened, except for the numbers (there being space for five characters), and the bottom of the fitting slopes up from the front edge at an angle of 45 degrees, thus allowing the light to escape through the diffusing glass, illuminating the porch.

A day view of one of these units installed is shown in Fig. 5. The fixture is strong and weatherproof; and although relatively small, the numerals are large enough to be seen at a considerable distance.

Fig. 6 shows the appearance of this at night, using a 10-watt lamp. There is sufficient light for easy reading from across the street. (The shadows on the porch appearing in this and previous figures, are due to an arc lamp located a short distance down the street.)

An illuminated house number is certainly a convenience; for, with it, the occupant of the house is not called from his bed to assure an inquirer that it is not the number he is seeking. Again, the doctor, visitor, or messenger can always find the house without losing several minutes looking up and down the block. Civic pride, as well as personal convenience, demands the installation of more illuminated house numbers.

Two Types of Lighting Standards Used in Boston

The upper picture shows the boulevard type of magnetite arc lamp, as installed on Huntington avenue, Boston. The Christian Science Church and Publishing House are shown in the background

The lamp is placed 18 feet above the sidewalk. The post is of wood from the top of the base casting to the porcelain insulator at the base of the lamp. This type of pole is used by the Edison Electric Illuminating Company, of Boston, to comply with the law which requires that poles be insulated for high pressure.

The lower photograph, taken in front of Trinity Church, in Copley Square, Boston, shows a Thoran arc lamp on a wooden pole. The pole has a heavy iron top and a heavy iron shell about the base. The lamp is at a height of about 50 feet from the sidewalk. Wire connections are underground. Alba globes of medium density are used on both types of lamps.

The editors are glad to receive photographs and data for possible use in this department from municipal officials, water works superintendents, consulting engineers, manufacturers or others having interesting information on water supply subjects.

A Proposed Standard Form of Schedule for Meter Rates

AT the annual convention of the New England Water Works Association, held in Boston last month, a carefully considered preliminary report was submitted by the Committee on Water Rates.* The following excerpts from this report will, it is believed, offer valuable suggestions to many municipalities in which the need is recognized for a more rational method of fixing rates for water to various classes of consumers.

The committee suggests a standard schedule in a form given below, which it believes to be adapted to general use. In this schedule the sliding scale of rates is recognized and three rates are provided. The schedule does not fix these rates. They are left to be fixed for each case as may be necessary to produce the required revenue. The quantities of water per annum, per quarter, or per month to which the three rates are applicable are defined and made uniform by the schedule.

In addition, a service charge is provided. In the event of there being local objection to using a service charge, the committee proposes an alternate arrangement, under which the amount of the service charge is applied as a loading to the price for a small amount of water first sold from each service, thus making in effect a fourth and higher rate for use only where no service charge is made.

Divisions of the Sliding Scale

It is proposed to make only three divisions of the sliding scale. At the present time there are many schedules in effect with more, and even with several times this number of divisions. The committee believes that in general more than three divisions are unnecessary and undesirable. Too many rates add to the complexity of the schedule, to the labor of applying it, and to the difficulty of understanding and comparing rates.

The committee proposes that all water up to 300,000 gallons per annum (equal to 822 gallons per day, or to 40,000 cubic feet per annum, or 10,000 cubic feet per quarter) shall be charged for at the first or highest rate. This rate for convenience will be called the Domestic Rate. The quantities of water covered by it will include substantially all water used by private residences, and also much of the water used by small hotels and smaller commercial and industrial establishments.

The second or Intermediate Rate will apply to quantities in excess of 300,000 gallons per annum up to 3,000,000 gallons per annum.

The third and lowest rate will be called the Manufacturing Rate and will apply to all water in excess of 3,000,000 gallons per annum from any service (equal to 8,220 gallons per day, or to 400,000 cubic feet per annum, or 100,000 cubic feet per quarter).

It is recommended that the price per 1,000 gallons or per 100 cubic feet be, in most cases, an even number of cents, omitting fractions, and that the intermediate price for water be to the nearest cent midway between the average and the mean proportional of the domestic rate and the manufacturing rate. By this rule the intermediate rate is definitely fixed at an amount midway or a little below midway between the domestic and manufacturing rates. There is, therefore, no need of discussing the amount of this rate. Consideration may be concentrated on the two main points in the schedule, the domestic rate and the manufacturing rate; and with these fixed, the intermediate rate will follow by fixed rule, and will be certain to be appropriate in connection with the others.

There are many scales of meter rates in effect at the present time in which the highest rate charged for the first water is unduly large in comparison with the lowest rate charged for the largest quantities. It sometimes happens that there is a ratio of ten to one or more between these rates. The committee disparages so great an amount of slide and recommends that the lowest price for water shall

* The Chairman of the committee is Allen Hazen, Consulting Engineer, 30 East Forty-second street, New York, the other members being Charles R. Bettes, A. E. Blackmer, A. W. Cuddieback, James L. Tighe and Philander Betts.

rarely be less than half of the domestic rate.

Where the price for manufacturing water is 75 per cent, or more, of the domestic rate, it is suggested that the intermediate rate may be omitted and that the manufacturing rate then apply also to the water that would otherwise be sold at the intermediate rate. If the rate for manufacturing water is 100 per cent of the domestic rate, both limits disappear and one flat rate will apply to all quantities.

Many works now make a flat rate for water. A flat rate can only be fairly applied in connection with a proper service charge. With an adequate service charge the reason for the sliding scale is greatly reduced, and there is much to be said in favor of the flat rate. The committee does not wish to urge the sliding scale in preference to flat rates where such are now used, and the proposed scale lends itself to use either with or without the sliding scale.

The principal reason for the sliding scale is that it costs more to distribute water to many small takers than to a few large ones. From the standpoint of cost only, the best way to take care of this excess cost is by means of the service charge. But to do this adequately would mean the adoption of a service charge so large as to be burdensome to the smallest takers. These smallest takers are not profitable to the system at low rates even with such service charges as the committee now proposes. Nevertheless they must be supplied, and it seems to be a wise policy to supply them at low rates, making the larger takers carry a proportion of the excess cost of supplying small consumers. The sliding scale affords a means, and perhaps the best means, of effecting this adjustment.

Service Charge

The committee believes that it is essential to make a substantial service charge in order to secure equitable rates for all. The service charge may be naturally made up of several parts. It suggests that the procedure to be followed in determining the amount of the service charge be as follows:

First, that the average amount of money invested by the works in the service pipe and meter be ascertained. Where the works furnish the service pipe to the curb line and the meter, the normal cost seems to be about $25 per service. Where the taker pays for the service pipe and the works furnish the meter, the normal cost seems to be about $10 for a ⅝-inch meter in position. The committee suggests that 10 per cent of this cost be taken as the first part of the service charge: that is to say, that $2.50 per annum be used where both service and meter are paid for by the works; $1.00 per annum where the meter only is furnished by the works; and that this part of the charge disappear where both pipe and meter are paid for by the taker. The committee believes that on the whole 10 per cent is a fair allowance for the depreciation in the service pipe and meter, and for the interest on the money invested in them. The structures are not long-lived, and occasional repairs are needed. A reasonably approximate figure is sufficiently close, and 10 per cent is used in this way.

The figures mentioned for cost of service and meter are believed to be representative, but they should be increased or decreased according to the ascertained average costs under local conditions. Round figures should be used in all cases as a matter of convenience, and because precision is unnecessary, and because it cannot be reached in most cases. For meters larger than the five-eighths domestic size correspondingly larger figures should be used.

Second, a sum per annum representing approximately the cost of reading the meters, keeping the meter records, making bills, and collecting the money. The amount of this item depends upon the frequency with which meters are read and upon local conditions; for ordinary domestic services where meters are read once a quarter $1 per annum may be a sufficient allowance. This figure may also be used without substantial injustice for services of all sizes, because when meters are read monthly the quantities are usually larger and the cost of meter reading becomes an inappreciable fraction of the bill

Third, an amount which will represent the approximate average value to the works of the water that passes a domestic meter without being registered. The normal service of a domestic meter for one day may be assumed to consist of passing 200 gallons of water, more or less, in about two hours, the whole time being made up of many short intervals during the day. During the remaining 22 hours no water will ordinarily be flowing. If the service pipe and plumbing are perfectly tight, no water will pass during those 22 hours; if there is a leak of such size that the water lost by it will turn the meter, then the meter will register the flow throughout the 24 hours, and all the water passing will be recorded, except that there may be some slip in the meter at a low rate. If there is a leak in the service or plumbing which allows water to escape, but in amount so small that it does not serve to move the disk or piston of the meter, then the amount of water lost by such leakage in the 22 hours when the piston or disk is not moving will be entirely unrecorded. Probably no meter in ordinary service will register a flow of less than 100 gallons in 22 hours. Many meters in actual service will allow much larger quantities to pass without registering. It is probable that the plumbing in every house has leaks at times, through defective washers in the faucets or automatic valves which permit the loss of water in amounts too small to be recorded. In some houses such loss is always taking place. In the aggregate the amount of this unrecorded leakage from plumbing is large. It probably furnishes the greatest single reason why the amount of water registered by meters never approximates closely the total quantity of water furnished by the system.

Water lost in this way is running at a steady rate throughout the 24 hours, and increases but slightly the peak load of the plant.

It can, therefore, be supplied at the lowest relative cost, and for the purpose of this estimate should be reckoned at the lowest rate charged for any water that is sold.

The amount lost per service will range from nothing to 100 gallons per day, and occasionally to much larger quantities. Assuming an average of 50 gallons per day per service at a minimum price of 10 cents per 1,000 gallons, the value of water so lost amounts to $1.82 per service per annum.

There are no adequate data upon which this loss can be computed, and the committee sees no way of securing such data at this time. Nevertheless it believes that the matter is an important one and that a substantial allowance should be made for such losses. It suggests for the present the use of $2 per annum for this item.

Upon this basis the service charge will amount to the sum of these parts, namely, first, 10 per cent of the average investment of the works in service pipe and meter; second, $1 per annum for reading meters, billing and collecting; third, $2 per annum for the probable value of unregistered water. For a domestic service, with ⅝-inch meter, the ordinary service charge may properly be $3, where service and meter are paid for by the taker; $4 where the meter is furnished by the works; and $5 or $6 where both meter and service pipe are paid for by the works, the lower figure being used where the average cost of a service pipe is under $15, the higher where it is greater than $15.

The figures used in the above paragraphs should be considered only as general approximations, to be modified to meet established local conditions, or upon more complete data. The committee suggests that the method is of first importance and should be first discussed and settled, and that the values to be then used under it should always be selected with reference to the conditions in each plant for which a service charge is to be established.

The charges for larger services will readily be reached by the application of the same methods, and the committee does not suggest any values for them at this time.

The committee recommends that the amount determined by the use of these methods, raised or lowered to a convenient round figure, should be charged for each service; that this charge should be made in all cases whether water is drawn or not; and that all water drawn from the service should be charged at current rates in addition thereto.

Many works at the present time make a charge for meter rent. In such cases, and otherwise if desired, the service charge may be called "meter rent," the amount being taken as the amount determined for the service charge.

The method of making a service charge separate from and in addition to the charge for water registered is the most convenient and equitable way of distributing the costs considered in the above paragraphs where they belong, and the committee recommends it for use in all cases.

Alternate Procedure

Where there is local objection to making a service charge (even though called meter rent), the following alternate and less desirable procedure may be used.

The amount that would be a fair service charge is computed as above. This amount is divided by 60 and the result to the nearest even cent is added to the domestic rate, and this new rate (which may be called a loaded or maximum rate) is applied to the first 60,000 gallons of water per annum drawn from each service. If cubic feet are used, the amount is divided by 80, and the result to the nearest even cent is added to the domestic rate per 100 cubic feet, and the increased rate is applied to the first 8,000 cubic feet per annum used from each service. In connection therewith, a minimum rate must be established. This minimum rate may be about $3 more than the computed service charge. This double procedure of loading the rate for the first quantity of water sold from each service and of establishing a minimum rate will accomplish in a rough way the general purpose of the service charge. It is less satisfactory because it is less fair as between the various small consumers drawing quantities of water that will be affected by it. It is as fair to the works and to the larger consumers because the loading of the first quantity of water sold by the method described will produce a sum nearly equal in the aggregate to that which would otherwise be directly charged for the service.

Gallons or Cubic Feet

It is most unfortunate that two units of measurement are in common use. It would be much better if one could be discarded. More than three-fourths of meters now in service record the quantity in cubic feet. According to replies to the committee's inquiries, schedules of water rates are about equally divided between cubic feet and gallons. The number of meters now being sold to register in gallons is increasing much faster than the total number sold. This indicates a gain in popularity of the gallon. There is much to be said in favor of each of these units. Replies to the circular letter of the committee indicated very evenly divided preference. In view of this condition, and in view of the further fact that members of the committee have different preferences, it is not thought best to attempt to recommend at this time that either unit shall be used to the exclusion of the other. It is absurd, however, that two units should continue in general use. The advantages of adopting either one would be vastly greater than any possible advantage in either.

In the interest of economy of labor, it is obviously desirable that the same unit should be used in any system for both meter registers and schedules. Thus the use of meters reading in cubic feet, with a schedule of rates in gallons, is undesirable and should be avoided by changing as rapidly as is possible so that both are on the same basis.

Forms of Schedule

The committee proposes the following form for a schedule for meter rates:

For each service supplied by ⅝-inch meter there shall be a charge for the service and meter per annum, of..... $.....

In addition thereto, for all water drawn there shall be charged:

	Cents per 1,000 gal.
For the first 300,000 gallons of water per annum, or any part thereof, the Domestic Rate of.....	.....
For water in excess of 300,000 gallons and under 3,000,000 gallons per annum, the Intermediate Rate of.....	.....
For water in excess of 3,000,000 gallons of water per annum, the Manufacturing Rate of	.....

The prices to be written in the schedule should be fixed in each case by the local authorities to meet local conditions, and to produce the required revenue, and the committee makes no suggestion as to how great they should be. It is further the intention that cubic feet shall be substituted for gallons if desired, the numbers being divided by 7.5, so that the actual quantities paid for under each rate will not be changed; also that the rates may be stated as semi-annual, the numbers being divided by 2; or as quarterly, the numbers being divided by 4; or as monthly, the numbers being divided by 12.

It is to be recognized that a monthly rate with one-twelfth the quantities, with varying rates of monthly use, will produce in some cases slightly different annual results from the corresponding annual rate, but it is recommended that such difference be disregarded, that the rates be made for whatever period meters are read, and that each record period be considered by itself in computing the charge.

A schedule under the alternative and less desirable arrangement, avoiding the term "service charge" or "meter rent," would read as follows:

Minimum charge for service with ⅝-inch meter, per annum..... $.....

	Cents per 1,000 gal.
For the first 60,000 gallons of water per annum, or any part thereof, at the Maximum Rate of.....	.....
For all water in excess of 60,000 gallons and under 300,000 gallons per annum, the Domestic Rate of.....	.....
For all water in excess of 300,000 gallons and under 3,000,000 gallons per annum, the Intermediate Rate of.....	.....
For all water in excess of 3,000,000 gallons per annum, the Manufacturing Rate of	.....

The report also contains valuable comparisons of meter rates now in force, and suggestions for a meter rate sheet on which may be conveniently plotted the average rates paid by consumers drawing different quantities of water per annum.

Analytical Tests at Water Purification Plants*

THE elimination of unnecessary analytical work is a matter that needs consideration at this time quite as much as the making of the necessary tests. Laboratory practice at various purification plants has shown that many of the determinations which are ordinarily included in the standard water analysis schedule are here of little or no importance. For example, the determination of nitrogen in the usual forms of free and albuminoid ammonia, nitrites and nitrates serves no particular purpose in water purification except in special cases. They neither assist the superintendent in the operation of the filter, nor give any adequate idea of the safety of the filtered water. On the other hand, some of the simpler physical tests, such as numerical determinations of turbidity, color and odor, microscopical examinations and tests for alkalinity, iron and carbonic acid, have come to be regarded as most valuable; and in special cases various other tests, such as dissolved oxygen and manganese. Bacteriological tests are, of course, important.

One step in making an analysis of water has never received half the attention that it deserves, namely, sampling. Of what value is it to use analytical methods of great refinement if the samples themselves are not representative, if the mass of water

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* From the report of the Committee on Statistics of Water Purification Plants, submitted at the annual convention of the New England Water Works Association, September, 1914. Blanks have been prepared illustrating the committee's recommendations regarding the form of report, the tests to be made, and the method of expressing the results. These blanks are as follows:

Table 1.—Chemical and Microscopical Character of Raw Water.
Table 2.—Turbidity and Color of Raw Water.
Table 3.—Bacteria in Raw Water.
Table 4.—Chemical Character of Water Delivered to Mains.
Table 5.—Turbidity and Color of Water Delivered to Mains.
Table 6.—Numbers of Bacteria in Water Delivered to Mains.
Table 7.—Numbers of B. Coli in Water Delivered to Mains.

All of the above tables are arranged to show the analytical data by months and years.

The chairman of the committee is George C. Whipple, Professor of Sanitary Engineering, Harvard University; the other members being Robert Spurr Weston, F. D. West, Frank W. Green and E. E. Lockbridge.

from which the sample is taken is not homogeneous, or if the water changes in character from one day to another? Samples for chemical analyses are almost never larger than 4 liters (1 gallon); and samples for bacteriological analyses are seldom larger than 100 cubic centimeters (4 ounces), while the quantities actually used for the different tests are still smaller. In counting the number of bacteria, the quantity is less than a thimbleful.

On the other hand, we know that bodies of water are not homogeneous. In a lake or settling basin there are vertical and lateral variations; a river is constantly changing, not only in volume but in the character of the water; filter effluents vary, especially the effluents from mechanical filters where the runs are short and the rates are high. The causes of these variations which affect the results of water analyses through unfair sampling are so numerous that they cannot be studied by themselves, and the only course left is to apply to them the laws of probability, or, in other words, to arrange the data secured in some such way that the importance of the inevitable variations may be indicated and an index of the character of the water examined be obtained.

Thus we see that a question of fundamental importance is that of frequency of collecting samples. The question is, how often must samples be taken to obtain reliable results? As a general proposition it may be stated that the frequency of sampling should depend upon the frequency of change in the character of the water examined. For a water of constant quality, a few samples taken at infrequent intervals may serve to give a fair idea of the water, but if a water be subject to great fluctuations in character, a few samples taken at long intervals might or might not give a fair idea of the water. The reliability of the average result will be determined by the laws of probability. The average result does not tell the whole story, for it eliminates the individual results, and a water supply should be safe and wholesome all of the time.

The frequency of sampling has a limitation, which is controlled by practical and financial considerations. In a small plant the cost of daily analyses would usually be prohibitive, and even weekly analyses might be a burden. It would be recognized, however, that results based on infrequent samples are less valuable than those based on frequent samples; and that irregular sampling gives the most unreliable results. In order to emphasize this point it seems desirable to establish certain grades of control of operation, based upon the character of the records kept, as follows:

First Grade: Water purification plants under first-grade supervision are those where the analyses of the filtered water are made one or more times a day, and where engineering and such other data regarding the operation of the plant as are necessary are collected by one or more attendants constantly employed.

Second Grade: Water purification plants under second-grade supervision are those where analyses are made regularly, say once a week or once a month, by a trained analyst, and where an attendant constantly on duty makes simple daily tests.

Third Grade: Filter plants under third-grade supervision are those where analyses are made irregularly and infrequently, and where no daily tests are made by the attendant.

Sometimes it is difficult to grade the supervision given a plant. As an example we have the Lawrence city filter, where daily tests are made during five winter and spring months of the year, and weekly tests during the remaining seven months. Here frequent analyses were made during those seasons which were most critical. This might be termed a mixed supervision of the first and second grades.

This grouping should not be considered as necessarily casting a stigma upon second- or third-grade supervision. Some water supplies may not demand first-grade records. In general it may be said that the safer the raw water, the lower may be the grade of analytical supervision. In other words, polluted waters require the purification plant to be operated with a higher factor of safety, and to this end a more careful analytical control is needed. Stored waters are safer than unstored waters, and with them a lower degree of analytical supervision may suffice. A corollary to this would be that small plants which cannot afford high-grade supervision of filters should endeavor to protect the quality of the supply by storage or by incorporating a large factor of safety in the design of the plant.

How to Handle "Four Corners"

Architects Offer Ideas for Neighborhood Centers—Liberal Prizes Bring Forth Interesting Sketches and Arouse Interest in the Ideal Development of Residential Districts

By George A. Damon

Dean of Engineering, Throop College of Technology, Pasadena, Cal.

AN event of more than ordinary significance to all who are interested in city planning, and especially in that phase of it having to do with the ideal development of residential districts, was the recent awarding of prizes in connection with the "Four Corners Competition," held under the auspices of Throop College of Technology, of Pasadena, Cal.

The competition, which was participated in by a number of architects, landscape architects and artists of ability both in Southern California and elsewhere, was the outgrowth of a study of actual conditions in Pasadena. Some time ago an unsightly shack was erected upon one of the prominent corners in a fine Crown City residence district and rented to a fruit vendor. A little later another owner built a hardly more prepossessing store for a groceryman on an opposite corner. The residents of the district took alarm and began an agitation to save the other two corners. Out of that agitation grew the Throop competition.

The prizes were offered with the idea of securing in graphic, understandable form inspirations for something better in neighborhood center developments. The problem taken up was just such a problem as had been brought home to the Pasadena neighborhood mentioned, and the competitors were asked to draw up plans for the ideal treatment of the "four corner" centers that inevitably spring up in every extensive residence area. It was hoped that in this way interest might be awakened in the question of the intelligent, effective and artistic arrangement of these, the smallest units in the great city plan.

The competitors were asked to assume that the value per acre of the land on each corner of their community centers was $12,500, and to consider the limit of expenditure allowed for improvements at from $35,000 to $55,000 per corner. Otherwise full latitude was given to their inventiveness and originality of taste.

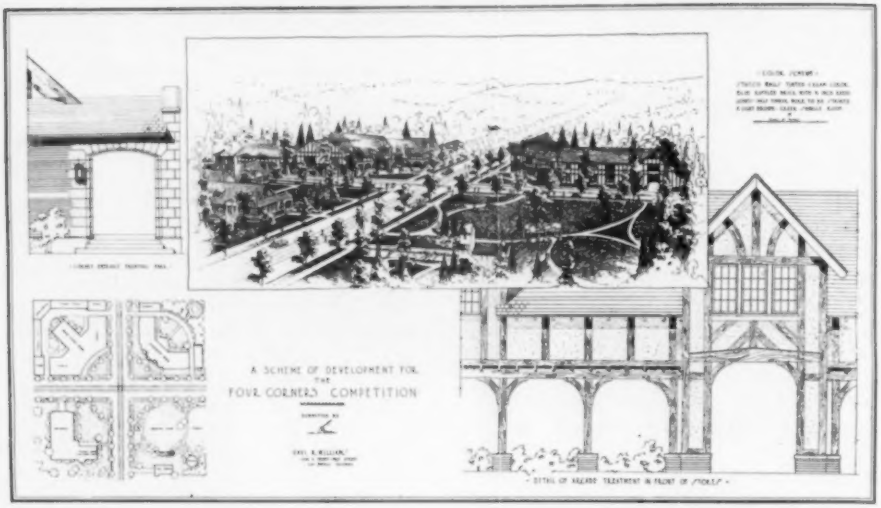
The committee of award, comprising architects John C. Austin, Elmer Grey and Albert R. Walker, of Los Angeles, gave the first prize of $200 to Paul R. Williams, of Los Angeles. The second prize of $100 went to the Cook-Rankin-Wyckoff Company, landscape architects, Los Angeles. Porter W. Dorr and Alex. J. Scholtes, of Boston, were given the third prize of $50. The judges in announcing their award stated that the margin of choice between the first two sketches was slight.

Prize Design

The design winning the first prize shows one corner devoted to a trading center, but with stores set back from the street and entrances grouped in an open arcade, making it possible to secure display space without using the sidewalks, or unnecessarily calling attention to the commercial character of the building. Delivery wagons are relegated to the rear through two driveways, and provision is made for an automobile garage and market stalls on the back of the lot.

On the corner directly opposite, an apartment is shown of the same general type of architecture. The pleasing feature of this part of the design is the "homelike" appearance of the building with its front lawn and ample space for playgrounds and flower garden in the rear. The "neighborhood church" and "community house" on a third corner suggest possibilities of cooperation in religion and recreation, which might well be considered in every neighborhood, particularly in the outlying districts.

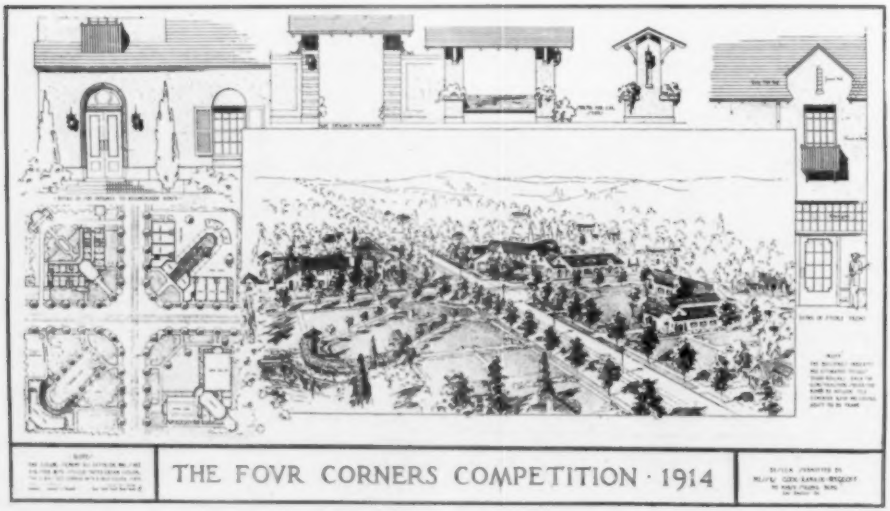
Upon the fourth corner, the design shows a combination of a small park and an automobile fire-engine house. Such an arrangement, it is explained, would allow the firemen to spend their surplus time pleasantly and profitably in maintain-



THE PRIZE-WINNING DESIGN

ing the flowers and lawn in the park.

The second prize design shows the "four corners" provided with a neighborhood park, a community building for lodges, library and moving pictures, an apartment house, and a group of stores about a municipal market. The features of this design are plenty of "open-air" space around all of the buildings, the convenience of the apartment arrangements, and the possibility of building stores on the "unit" principle, so that the trading center can be developed as the surrounding district builds up.



THE PLAN THAT WON SECOND PRIZE

Ideas for the Commercial Executive

Building and Loan Association

LYNCHBURG, VA.—The recent successful promotion by the Chamber of Commerce of a local Mutual Building and Loan Association is, perhaps, unique in commercial organization work, as these institutions are usually started by a few real estate men who realize possibly more than others the need of such in the development of a community.

The new association in Lynchburg makes a start with nearly 300 stockholders, who have subscribed to a total of something over 2,000 shares. The plan of organization is the same as that used in every part of the state of North Carolina, where in one or two cities these institutions have been in successful operation for thirty-three years.

In procuring a successful outcome of this project the Chamber of Commerce of Lynchburg was very ably assisted by Mr. E. L. Keesler, president of the North Carolina League of Building and Loan Associations.

The new association commenced business in August, and will open a new series every six months. Mr. B. B. Adams, a well-known real estate man, is secretary, and Mr. D. M. Penick, head of a wholesale drug house, is president. The board of directors is made up of prominent bankers and business men.

A local mutual building and loan association, if operated under a properly restricted plan in which all stockholders participate alike, is a very useful medium for the encouragement of thrift and good citizenship among the wage-earning classes. To get satisfactory results it is essential that the association be governed by a board of directors made up of men in the community who have no selfish motives and who are actuated by a desire to help the community.

The chief advantage in the association's being promoted by a commercial organization is that it establishes public confidence in the new organization and prevents the danger of its being handicapped by the suspicion of its being operated for the benefit of a few.

A Poultry Association

TAUNTON, MASS.—The Taunton Poultry Association has recently been formed by the Taunton Chamber of Commerce for the purpose of encouraging the raising of fancy and utility poultry, to develop a better market for poultry products, and to arouse greater interest in the subject through the holding of an annual poultry exhibition.

This latest organization to be formed by the members of the Taunton Chamber of Commerce is the outgrowth of the poultry show which was held in Taunton some months ago, when the need of such an association was strongly emphasized. All residents of Taunton and vicinity are eligible to membership, and it is felt that membership in the association will be especially valuable to the poultry owners themselves.

There will be monthly meetings of the organization. It is the intention to have prominent and successful poultry men address the sessions upon the proper methods of housing, incubating, brooding, caponizing, marketing, preparing poultry for the exhibition room, and all matters of interest to owners of poultry.

The second annual poultry show is to be held under the auspices of the Chamber of Commerce, and it is expected that it will be unusually successful as a result of the activities of the Taunton Poultry Association.

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Organization News in City Daily

WINONA, MINN.—The Winona Association of Commerce has found that it is much easier to acquaint non-members as well as members with the efforts of its organization by the insertion of a few columns weekly in one of the Winona dailies than by the publication of a weekly or monthly bulletin. The feeling was that an official "organ," to make an imposing appearance, must contain so much material that a large amount of it is lost upon busy men; also, since an association bulletin is

mailed only to members, news of its affairs would not thus reach the general public, as would be the case when published in the daily papers.

An arrangement, therefore, was entered into with the *Winona Daily Republican-Herald* to act as a medium of information through its news columns between the management and members of the Association of Commerce. A weekly department has been established in the paper entitled "Association of Commerce Notes." At the end of each week's collection of notes appears the statement, "Continued next Tuesday." A little over four newspaper columns were devoted to the matter in a recent issue of the paper, and the various subjects were handled exactly as if they were published in an organization bulletin. This publicity costs the Association absolutely nothing except the time consumed in its preparation.

Under the heading "News and Views of the Elizabeth Board of Trade," a similar weekly department is being conducted in the *Evening Times* of Elizabeth, N. J., and is dealing definitely and broadly with local and foreign trade conditions.

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Municipal Control of Water Front

OAKLAND, CAL.—A plan for the management of the harbor and water front, under which the municipal wharves are to be constructed and operated and the general system of transportation by water developed to high efficiency, has been worked out by the Oakland Chamber of Commerce. Other local organizations have coöperated in the development of this plan, which has been approved by the city government.

The plan provides for a Board of Harbor Commissioners, who are to be appointed by the Mayor and are to have complete control of the policies relating to the harbor and water front government and management. Provision is also made for the appointment of a Harbor Manager as the executive officer of the Harbor Commission. He will be expected to supervise the construction, maintenance, and management of all the wharves and water front properties and of the harbor in general; one of his special duties being the development of traffic for the municipal wharves.

Under a state grant, Oakland's city government has complete and unrestricted power to control and govern all of the water front of the city. One of the duties of the Port Commissioners will be to formulate rules and regulations, and, if necessary, recommend legislation, city or state, that may be necessary to make effective this right; including the prescribing of rules and regulations for the conduct of business over wharves held under lease, or otherwise, by railroads or other business or private interests.

Items of Municipal and Civic Progress

The Washington Alleys

On August 6, the day that Mrs. Wilson, the wife of the President, died, it was reported that Congress had, at her dying request, passed a model bill to eliminate objectionable alleys and bad housing condition in Washington. The report was given wide circulation, but, unfortunately, it was an erroneous report, for it was only the Senate that took action that day, and it passed a bill that had originated in the Senate. This was not the model bill that had been introduced in the House of Representatives after it had been drawn up with very great care by a committee of Washington men and women and approved by both Mrs. Wilson and the President. Some days later the House District Committee reported favorably the model bill, but a week later it was set aside and the Senate bill given the right of way, and on September 14 it was passed. The Senate bill really represents very little advance in the alley proposition, for it is not much more than a reënactment of an act of 1892, which then prohibited further construction of alley houses and provided regulations for those already existing.

The model bill, unfortunately set aside, proposed the gradual but actual elimination

of the existing houses and the bad housing in Washington, and in minute detail provided the methods and procedure by which they could be eliminated during a period covering ten years. The bill just passed contains none of those details, and the only respect in which it represents an advance is that it specifies that the present structures shall be done away with by the first of July, 1918, but provides no machinery or instruction for the consummation of the work. To be effective, the new bill must be followed by supplementary legislation which will place definitely on the municipal authorities the responsibility for tearing down the poor dwellings already standing and transforming objectionable alleys, many of them inside alleys and courts, into regular thoroughfares. To the extent that the bill represents an expression of the desires of the people of Washington for improved alley conditions, it is considered a step in the right direction, but it is by no means the model bill which had been so carefully drawn and which Mrs. Wilson so deeply wished to be enacted into law.

RICHARD B. WATROUS.

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Home Rule in Taxation

At the November election the people of California will have an opportunity to ratify an important home rule amendment passed by the 1913 legislature. The form in which this proposed amendment to the state constitution will appear on the ballot is as follows:

LOCAL TAXATION EXEMPTION. Assembly Constitutional Amendment 7 adding section 8½ to Article XIII of Constitution, authorizes any county or municipality to exempt from taxation for local purposes in whole or in part, any one or more of following classes of property: Improvements in, on, or over land; shipping; household furniture; live stock; merchandise; machinery; tools; farming implements; vehicles; other personal property except franchises; provides that ordinance or resolution making such exemptions shall be subject to referendum; and requires that taxes upon property not exempt from taxation shall be uniform.	YES	
	NO	

An amendment intended to accomplish a similar purpose was submitted by initiative petition in 1912, but was not adopted. That amendment was so broad that it would have permitted any county or local district to establish its own tax system, including the methods and dates of collection, etc., and it was opposed strongly on the ground that it would have led to administrative chaos. The present amendment confines the local option to a selection of the class of property which shall be exempted from county or local taxation. It does not affect taxation for state purposes. California recently adopted the policy of separating the sources of state and local revenue pursuant to an amendment adopted in 1910, so there is now no state tax on property locally assessed (except a special tax for the San Francisco Exposition).

The principle of home rule in taxation has been approved by the California League of Municipalities at its last three annual conventions. The amendment has also been endorsed by more than thirty individual city councils throughout the state.

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Municipal Carnival at Los Angeles

On September 8 Los Angeles celebrated the one hundred and thirty-third anniversary of its foundation in an exceptionally interesting carnival. The celebration, which was under the auspices of the Municipal Employees' Club, attracted crowds estimated to number about 35,000. As all the participants gave their services without charge, many important concerns contributing generously in a material way, the expense incurred was slight. To defray this, bronze medals commemorating the anniversary were sold at the price of ten cents.

The decorations included an elaborate arrangement of electric lights, strung in lines up the hill upon which is located the Normal School building about which the festivities centered, and converging at the dome of the building in a massive electric seal of the city. Entertainment was furnished simultaneously in different parts of the grounds and building. While playground activities, such as Indian dances, camp-fire songs and a Hiawatha pantomime, held the attention of onlookers in one place, other features, including police drills, exhibits of fire fighting, and band concerts, attracted the visitors in another section. A ukalele chorus of boys representing the schools and the Civic Theatre roamed about interspersing music. In one corner of the grounds open-air motion pic-

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We produce every possible character of municipal signs—any size, shape, color combination or design. Without obligation our **Service Department** will be pleased to submit sketches and quotations. Additionally, we will send FREE, at our expense, to any authorized purchasing official or body a useful and attractive sample of finished Porcelain Enameled Iron. **Write Department C.**

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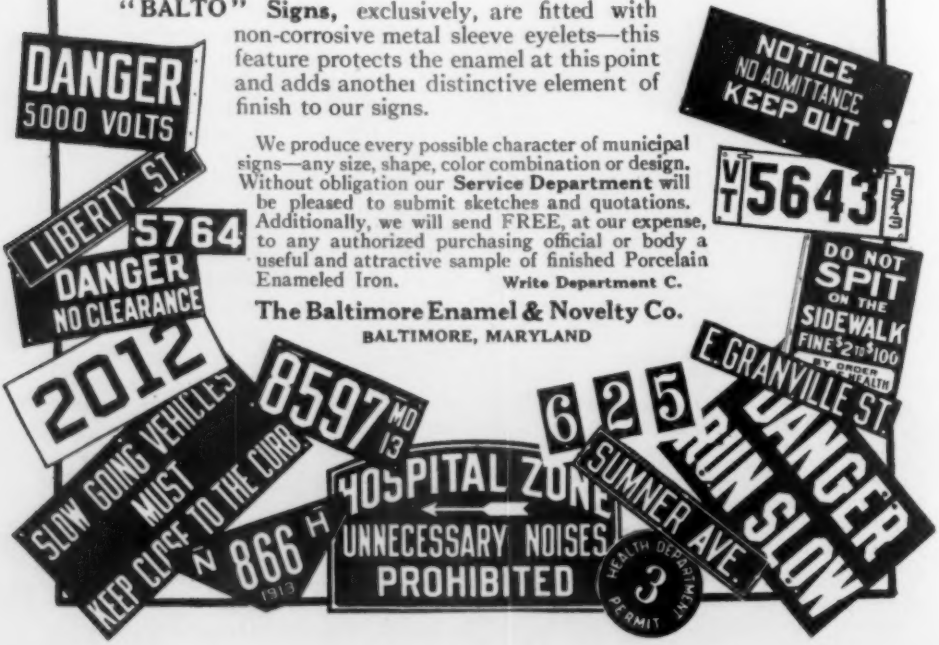

tures of the St. Louis pageant were shown, and in another corner were pictures illustrating the physical development of Los Angeles and other phases of civic progress.

The chief feature of the indoor program was a pageant entitled "Under Four Flags," depicting the founding of the city, its changing history under four flags, and its aspirations for the future.

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Partial List of Improved Housing Companies

The accompanying tabulation of improved housing companies has been compiled by Arthur C. Comey, of the Massachusetts Homestead Commission, Boston. It is the result of inquiries sent by Mr. Comey to such companies as were known by him to be engaged in improved housing, and not organized primarily for profit.

It is believed that many other such companies exist. Details of these should be sent to Mr. Comey, who is a committee of one on bibliography of the Construction Section of the National Housing Association.

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Commission Government in Pennsylvania

In an address recently delivered before the Pennsylvania League of Cities of the Third Class, Mr. A. M. Fuller, President of the Allied Civic Bodies, summarized reports from the twenty-eight cities of the third class concerning their progress under commission government during the first six months of 1914. This information, received in the form of answers to questions, includes reports from 19 banks and 20 individuals and indicates general satisfaction with the commission form of government. The questions and answers were as follows:

1—*Has the new form of government in your opinion proved a success?*

Twenty-two cities reported very briefly, yes; three no, and three no opinion.

2—*Are your citizens generally pleased with the new system?*

Twenty-one cities reported yes; three no, and four no opinion.

3—*Has it tended to create more interest in city affairs on the part of citizens?*

Twenty-three cities reported yes; two no, and three no opinion.

4—*Would not the "General Manager plan" in connection with the present system render the government still more efficient?*

Twenty-one cities reported yes and seven cities reported no.

PARTIAL LIST OF IMPROVED HOUSING COMPANIES

Date of Information	Name of Company	Location	Date Begun	Div. Limit %	Capital	Value of Property	Area in Acres	No. Families per Acre	Houses Sold: No. of Families	Houses Sold: Average Price per House	Houses Rented: No. Rooms in Houses	Houses Rented: Average Rent per Month	Tenements Rented: No. of Families	Tenements Rented: Average Rent per Month	Total No. of Families Housed	Remarks
1914	Sunnyside Heights Realty Co.	Atlanta, Ga.	1912	5[illegible]	$ 30,000	$ 495,000	100	4	25		4				25	Still at work
1914	Midway Home Building Co.	Albany, N.Y.	1911	4	70,000	131,000	6	11	43	$1100-3300	15	$ 9.17-30			60	
1914	Millicent Garden Suburb, Inc.	Millicent, Mass.	1914	5	16,500	47,000	56	5								
1914	Boston Cooperative Building Co.	Boston, "	1911	7	343,000	335,000	34						125	332.	332	Work is progressing satisfactorily
1914	Boston Dwelling House Co.	Boston, "	1912	5	543,000	828,716	12.5	10	6	$900-3600	21	$12.-35	6	7.8	$16.-30	101	
1914	Improved Dwelling Assn.	Boston, "	1895	5	150,000	240,316	3							24	$9.-11	24	3% dividend Now
1914	Waverley Gardens	Mount Auburn, Mass.	1														
1914	Improved Dwellings of Mt. Auburn	Brooklyn	1877	5	600,000	600,000			34			$ 13	18	500	534	Not incorporated
1914	Cincinnati Model Homes Co.	Cincinnati,	1913	5	500,000								18	66	66	
1914	J. P. Schmidlapp	Cincinnati,	1914	5	190,000						96	17½-21			96	Work is estimated
1914	State Realization Homes Co.	Brooklyn, N.Y.	1911	5	1,500,000	2,500,000	250		138	$700-4000	30	$ 13.-35	1	11	1 $3½	172	
1914	Cambridge Housing Co.	Cambridge, Mass.	1901	5	50,000				16	$1,000	5	18.-30				34	
1914	Improved Housing Assn.	Salt Lake City, Utah	1913	6													
1914	Improved Housing Assn.	Halifax, N.S.	1914	6													
1914	Municipal Housing Co.	Los Angeles, Calif.	1913	6													
1914	Improved Housing Assn. of New Haven	New Haven, Conn.	1914	5	13,000	53,000					10	9½-17			16		
1914	City Realization Homes Co.	New York City	1913	5	4,000,000	6,793,918			97	$700-4000	153	9.-35	58	13.77	89-35	3057	
1914	Overlook Hill Assn.	Philadelphia, Pa.	1894	4	200,000	175,000					338	15-17½	45	13.77	9½-19	536	
1914	Improved Tenement Corporation	Providence, R.I.															
1914	Quakers Sanitary Housing Co. (Ltd.)	Quakers, Pa.	1914														
1914	Forrest Housing Co.	Trenton, N.J.	1912	6	1,000,000	1,500,000	210				6	20.	32-35½			38	
1914	Washington Realty Housing Co.	Washington, D.C.	1913	5	196,000	192,268			50			30	9.-12			108	
1914	Welfare of the Sanitary Improvement Co.	Washington, D.C.	1897	5	300,000	364,035						578	6.75-18			578	
1914	Middlesex Co.	Wilmington, Del.	1903	-	-	587,000	10.5	33½			150	100	9.25-35½			250	4 per cent on $1,250
1914	Sutton Homes Co.	Lewistown, Pa.	1910	5	125,000	200,000	8				87	100	9.-35			87	
	Total 28 Companies				$2,418,330	$5,079,036	731.5		1423		760	1184		2241	7098		

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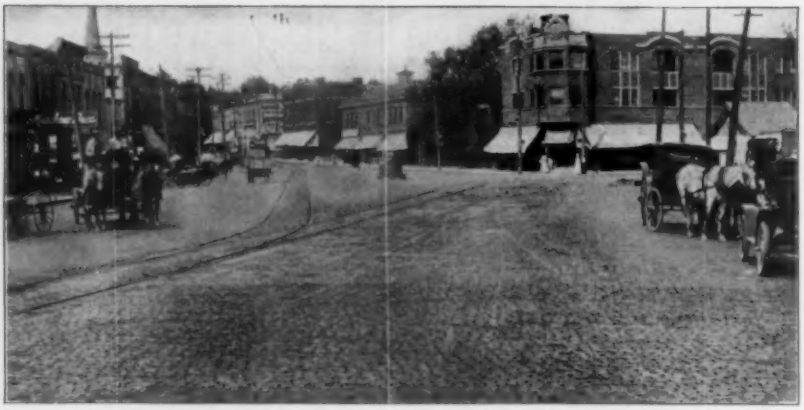

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A filler must be waterproof under all conditions, otherwise frost and rain will get in and ruin the foundation.

Paving Pitch is the only filler proved waterproof under all conditions. Asphalt becomes weak in adhesive power in cold weather—the brick shrinks away from it, and water seeps in through the cracks.

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Cement is too rigid. It crumbles under vibration, and cracks and "blow-outs" occur in hot weather which later let in the water. With Paving Pitch every joint is an expansion joint, and is waterproof under all conditions. There are Pitch-filled pavements 30 years old and in perfect condition today.

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Three Recent Appointments

The last few weeks have brought these important appointments to three men well known to THE AMERICAN CITY's readers:

Frederic C. Howe has been appointed by President Wilson as Commissioner of Immigration at the Port of New York.

The appointment of Edward E. Pratt, of the Industrial Bureau of the Merchants' Association of New York, as Chief of the U. S. Bureau of Foreign and Domestic Commerce has been sent to the Senate.

Thomas Adams has been called from London to become the City Planning Expert of the Commission of Conservation of the Dominion of Canada.

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The City Planning Exhibitions

A remarkable illustration of the widespread development of the city planning idea is the fact that the latest engagements for the two City Planning Exhibitions, prepared by the American City Bureau, are over five thousand miles apart.

The larger of these exhibitions, prepared for cities of over one hundred thousand population, was shown September 14-30 in the city of Santiago, Chili, South America. It had been contracted for by the city administration.

The smaller of the exhibitions is to be shown at Sioux City, Iowa, October 15-17, inclusive, in connection with the meeting of the Iowa Chapter of the American Institute of Architects.

On October 21 and 22 the same exhibition will be a feature of the convention of the League of Minnesota Municipalities in Mankato, Minn.

+ +

Preparing for the Panama-Pacific Exposition

This photograph shows two of the skilled workers at the Panama-Pacific International Exposition in a perilous position on the great Tower of Jewels. The picture is taken at a height of 300 feet above the Court of the Universe, the great central court of the exposition. The total height of the tower, which will be the dominating architectural feature of the exposition, is 435 feet. The large oval space in the left foreground is a part of this court. The large arch immediately to the left of the seated workmen is the Arch of the Rising Sun, to be crowned by a superb sculptured group representing Oriental civilization. The square court to the right of the standing workmen is the Court of Abundance. Still further to the right is the vast Palace of Machinery, almost one thousand feet in length. Beyond the Palace of Machinery are the United States transport docks and

AT WORK ON THE PANAMA-PACIFIC EXPOSITION

Only this One Page

to tell you about

ATLANTIC Pumping Engines

Right on this page is your **only** chance, in this issue of The American City, to learn about Atlantic Pumping Engines—a message which deserves a good-sized **book** to do it justice! This is **small** space, of course, in which to say all we want about a "big" thing. Excuse the small space, read it through and write us if interested and we will tell you the whole story.

And while you are about it—**be sure to avail yourself** of our FREE TRIAL OFFER.

ATLANTIC PUMPING ENGINES

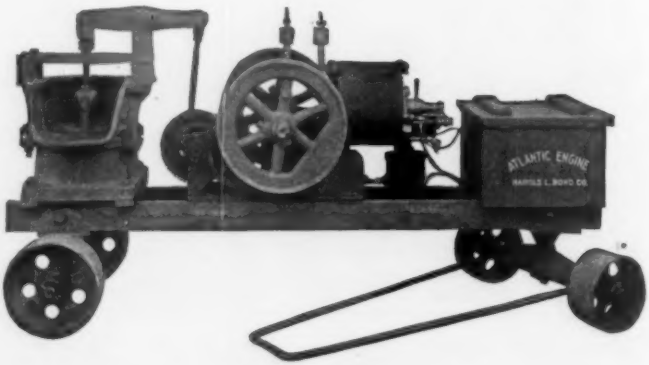
—do the work of 8 men.

—require only 1 pint of gasoline per hour.

—operate without expensive repairs.

—run themselves; constant "tending" not necessary.

—can be regulated while running at any speed.



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Manufacturers of

Ross Concrete Spade, Andrews' Concrete Tamper, Safety Trench Braces, Felton's Sewer and Concrete Rods and Pearl Brand Suction Hose.

the Fort Mason military reservation. In the background is San Francisco harbor, where Alcatraz Island can be barely discerned.

Conventions and Exhibitions

ON THE CALENDAR

OCTOBER 3-8.—ST. PAUL, MINN.

American Prison Association. Secretary, Joseph P. Byers, Trenton, N. J.

OCTOBER 5-8.—ATLANTIC CITY, N. J.

American Humane Association. Secretary, Nathaniel J. Walker, Albany, N. Y.

OCTOBER 6-9.—BOSTON, MASS.

American Society of Municipal Improvements. Secretary, Charles Carroll Brown, Indianapolis, Ind.

OCTOBER 7-9.—LAWRENCE, KAN.

League of Kansas Municipalities. Secretary, C. H. Talbot, Lawrence, Kan.

OCTOBER 12-14.—DEL MONTE, CAL.

League of California Municipalities. Annual Convention. Secretary, H. A. Mason, Pacific Building, San Francisco, Cal. Also First California Conference on City Planning; Secretary, Committee of Arrangements, Charles H. Cheney, Crocker Building, San Francisco, Cal.

OCTOBER 20-22.—WASHINGTON, D. C.

American Institute of Criminal Law and Criminology. Secretary, Henry Winthrop Ballantine, University of Wisconsin, Madison, Wis.

OCTOBER 20-23.—NEW ORLEANS, LA.

International Association of Fire Engineers. Headquarters, Hotel Grunewald. Secretary, James McFall, Roanoke, Va.

OCTOBER 21-22.—MANKATO, MINN.

League of Minnesota Municipalities. Annual Meeting and City Planning Exhibition. Secretary, Prof. Richard R. Price, Minneapolis, Minn.

OCTOBER 28-31.—MILWAUKEE, WIS.

Northwestern Road Congress. Secretary, James P. Keenan, Suite 70, Sentinel Building, Milwaukee, Wis.

NOVEMBER 9-14.—ATLANTA, GA.

American Highway Association. Business Manager, Charles P. Light, Colorado Building, Washington, D. C.

NOVEMBER 10-15.—MUSKOGEE, OKLA.

Southern Commercial Congress. Executive officers: Senator Duncan U. Fletcher, President, Jacksonville, Fla.; Dr. Clarence J. Owens, Managing Director, Riverdale, Md.

NOVEMBER 12-14.—BOSTON, MASS.

American Association for Study and Prevention of Infant Mortality. Executive Secretary, Miss Gertrude B. Knipp, 1211 Cathedral Street, Baltimore, Md.

NOVEMBER 12-14.—PHILADELPHIA, PA.

Conference of American Mayors for the Discussion of Utility Problems. Acting Director, Clyde L. King, Room 216, City Hall, Philadelphia, Pa.

NOVEMBER 17-21.—BALTIMORE, MD.

National Municipal League. Secretary, Clinton Rogers Woodruff, North American Building, Philadelphia, Pa.

NOVEMBER 27-DECEMBER 6.—JACKSONVILLE, FLA.

Southern Health Exhibition. In connection with the Annual Meeting of the American Public Health Exhibition. Chairman, Executive Committee, Dr. C. E. Terry, City Health Officer, Jacksonville, Fla.

NOVEMBER 30-DECEMBER 5.—JACKSONVILLE, FLA.

American Public Health Association. Secretary, Prof. Selskar M. Gunn, Massachusetts Institute of Technology, Boston, Mass.

DECEMBER 2-4.—WASHINGTON, D. C.

American Civic Association. Secretary, Richard B. Watrous, Union Trust Building, Washington, D. C.

DECEMBER 9-12.—RICHMOND, VA.

National Society for the Promotion of Industrial Education. Secretary, C. A. Prosser, 105 East Twenty-second Street, New York City.

DECEMBER 12-19.—NEW YORK CITY.

International Exposition of Safety and Sanitation. Under direction of American Museum of Safety. Director, Dr. William H. Tolman, 29 West Thirty-ninth Street, New York City.

DECEMBER 14-17.—CHICAGO, ILL.

American Road Builders' Association. Secretary, A. W. Dean, C. E., Massachusetts Highway Association, Boston, Mass.

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National Housing Conference Postponed

The National Housing Conference, scheduled for Minneapolis, October 21-23, has been postponed because of disturbances due to the European war.

A Partial List of Cities Lighted with Ornamental Luminous Arc Lamps

Akron, Ohio
Allentown, Pa.
Ann Arbor, Mich.
Atlantic City, N. J.

Baltimore, Md.
Bangor, Me.
Beverly, Mass.
Biwabik, Minn.
Boise, Idaho
Boston, Mass.
Brandford, Ont., Can.
Brookline, Mass.
Buffalo, N. Y.
Butte, Mont.

Calgary, Alta., Can.
Cambridge, Mass.
Chattanooga, Tenn.
Clearwater, Fla.
Columbia, S. C.
Crookston, Minn.

De Kalb, Ill.
Detroit, Mich.
Dixon, Ill.
Dubuque, Iowa

East St. Louis, Mo.
Edmonton, Alta, Can.

Fall River, Mass.
Fort Wayne, Ind.

Galveston, Texas
Glasgow, Mont.
Glendive, Mont.
Goshen, Ind.
Green Bay, Wis.

Halifax, N. S., Can.
Hammond, Ind.
Harrisburg, Pa.
Haverhill, Mass.
Holyoke, Mass.

International Falls, Minn.

Jacksonville, Fla.
Jersey City, N. J.

Keokuk, Iowa.

Kingston, Ont., Can.
Lexington, Ky.
Lindsay, Ont., Can.
Lockport, N. Y.
Lorain, Ohio
Lynchburg, Va.
Lynn, Mass.

Malden, Mass.
Milwaukee, Wis.
Missoula, Mont.

Nashua, N. H.
Negaunee, Mich.
New Haven, Conn.
Newport, R. I.
Newport News, Va.
Niagara Falls, N. Y

Ocean City, N. J.
Ocean Grove, N. J.
Ogden, Utah
Owatonna, Minn.

Peterborough Ont., Can.
Pittsburg, Pa.
Pittsfield, Mass.
Providence, R. I.

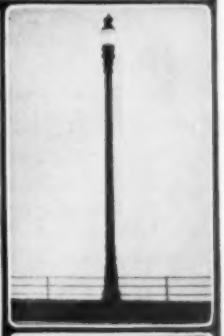
Rochester, N. Y.

Sacramento, Cal.
Salamanca, N. Y.
San Francisco, Cal
Schenectady, N. Y.
Spokane, Wash.
Southbridge, Mass

Tacoma, Wash.
Tampico, Mex.
Toledo, Ohio

Utica, N. Y.
Visalia, Cal.

Warsaw, N. Y.
Washington, D. C.
Westmount, Can.
Wildwood, N. J.
Winona, Minn.
Winnipeg, Man., Can.
Woonsocket, R. I.
Worcester, Mass.



General Electric Company

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Sales Offices in all large cities

Municipal and Civic Publications

Copies may be ordered of THE AMERICAN CITY, *with the exception of Government publications and those indicated as free, which should be ordered direct from the offices publishing them*

TERMAN, LEWIS M., Associate Professor of Education, Leland Stanford, Jr., University.

The Teacher's Health. 1913. 137 pp. **60 cents**

Much information not generally known or thought about is given in this book, and the importance of the badly neglected problem of the teacher's health is made clear. The author's suggested remedies would include, among other things, a physical examination of all entrants to normal schools, and greater attention to the subject of applied hy iene during the normal school course. There is a useful bibliography on personal and mental hygiene.

MORRISON, CHARLES E., C. E., Assoc. M. Am. Soc. C. E.

Earth Roads. 1914. 30 pp. Diagrams. **50 cents**

The elementary principles of the construction and maintenance of earth roads (including sand-clay and burnt-clay roads) are here presented. Location, costs, traction, grades, soil conditions, drainage, width of roads, dragging, etc., are among the subjects covered.

COLE, PERCIVAL R., Ph. D.

Industrial Education in the Elementary School. 1914. 64 pp. **35 cents**

The principles of industrial education in the elementary school as distinct from vocational training are discussed in this volume. There is a chapter of suggestions for reconstructing the school curriculum to include industrial education, also a chapter on the reconstruction of school methods, with a view to providing for observation of industries and other new features.

ROWNTREE, B. SEEBOHM, and PIGOU, A. C.

Lectures on Housing. (The Warburton Lectures for 1914.) Manchester, England, 1914. 70 pp. **60 cents**

Mr. Rowntree's lecture, entitled "How Far It Is Possible to Provide Satisfactory Homes for the Working Classes at Rents Which They Can Afford to Pay," deals with the problem in an original, constructive manner, showing the result of independent investigation and thought. The second lecture, covering certain aspects of the housing problem regarded as part of the general problem of poverty, constitutes a well presented review of the situation.

WATROUS, RICHARD B., Secretary, American Civic Association.

Personal Observations of Some Developments in Housing in Europe. (Reprinted from the July, 1914, issue of the Journal of the American Institute of Architects.) July, 1914. Quarto. 15 pp. 18 photographs. **10 cents**

DEPARTMENT OF PUBLIC WELFARE, CLEVELAND, OHIO.

An Investigation of Housing Conditions of Cleveland's Workingmen—the Best, the Average, the Worst. (By the Division of Health, Bureau of Sanitation.) 1914. 34 pp. Illustrated. **Free**

Reprint from *The Cleveland Medical Journal*, April issue, 1914, Vol. XIII, No. 4.

CHICAGO CITY WASTE COMMISSION.

Report of the City Waste Commission of the City of Chicago. 1914. 69 pp. Diagrams. **Free**

NICHOLS, ROY T., Department of Hygiene, Western Reserve Medical School.

A Study of Causes of Tuberculosis. (Reprinted from *Monthly Bulletin*, Ohio State Board of Health, February, 1914.) 1914. 14 pp. Illustrated. **Free**

Based upon the records of 250 cases of the tuberculosis dispensaries, and upon the housing records of the Bureau of Sanitation of the Cleveland Health Department.

THE MUNICIPAL REFERENCE BUREAU, UNIVERSITY OF CINCINNATI.

The Municipal Reference Bureau, University of Cincinnati: What It Is; What It Does; How It Works. 1914. 8 pp. **Free**

MASSACHUSETTS HOMESTEAD COMMISSION.

First Annual Report of the Homestead Commission. 1913. 366 pp. (Public Document No. 103.) **Free**

WISCONSIN TAX COMMISSION.

How to Assess Property in Cities and Rural Towns. Practical Suggestions by H. V. Cowles and J. H. Leenhouts. 1914. 62 pp. **Free**

FETHERSTON, J. T., Mem. Am. Soc. C. E., Former Superintendent of the Bureau of Street Cleaning, New York City.

Report to the President of the Borough of Richmond: Summary of Results on Refuse Disposal at the West New Brighton and Clifton Destructors in the Borough of Richmond, the City of New York. 1914. 19 pp. Illustrated. **Free**

THE PROPORTIONAL REPRESENTATION SOCIETY.

The Need of Proportional Representation in Municipal Elections. (P. R. Pamphlet No. 26.) June, 1914. 14 pp. **Free**

SEATTLE JUVENILE COURT.

Why Children Go Wrong. (Annual Report of the Seattle Juvenile Court for 1913.) 1914. 48 pp. Illustrated. **Free**

Contains "Court Methods, Mothers' Pensions and Community Dangers," by Judge Archibald W. Frater, and "The Responsibility of the Home Physical and Mental Conditions," by Lilburn Merrill, M. D., Director of Diagnosis.

NATIONAL FIRE PROTECTION ASSOCIATION.

Salem Conflagration. (Salem, Mass., June 25, 26, 1914.) 1914. Quarto. 16 pp. Photographs and diagrams. **10 cents**

Read What Julian Street Says About "MORRIS" Cast Iron Ornamental Poles in Battle Creek, Mich.

The Street Illumination of Battle Creek, which called forth the praise of Mr. Street. They are Morris Poles, Design No. 40005

This paragraph appears in a recent article entitled "Michigan Meanderings" in Collier's Weekly, and was written by Julian Street. Such unbiased statements from a critical and widely traveled man mean much. Has *your* city anything to learn from the West?

Drink Kaffir Tea — the Flavor Lasts!

THE principal street of Battle Creek may be without amazing architectural beauty, but it is at least well lighted. On either curb is a row of "boulevard lights," the posts set fifty feet apart. They are good-looking posts, too, of simple, graceful design, each surmounted by a cluster of five white globes. This admirable system of lighting is in very general use throughout all parts of the country excepting the East. It is used in all the Michigan cities I visited. I have been told that it was first installed in Minneapolis, but wherever it originated, it is one of a long list of things the East may learn from the West.

After driving about for a time we drew up. Looking out, I came to the conclusion that we had returned again to the railway station.

It was a station, but not the same one.

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CUBBERLEY, ELLWOOD P., Professor of Education, Leland Stanford, Jr., University.

State and County Educational Reorganization. 1914. 357 pp. **$1.37**

Consists of an educational Constitution and Code for the hypothetical state of Osceola. Among the many novel features introduced is that involving the abolition of the district system in favor of a county-unit system of school administration.

WISCONSIN FREE LIBRARY COMMISSION.

New Types of Library Buildings. 1913. 88 pp. Illustrated. **50 cents**

Contains photographs and plans of many small library buildings recently erected, which exemplify the idea that the exteriors of such buildings should present a useful and comfortable, rather than a so-called classic appearance.

CABOT, ELLA LYMAN, Member of the Massachusetts Board of Education.

Volunteer Help to the Schools. 1914. 141 pp. **60 cents**

A stimulating discussion of the possibilities open to individuals and to societies, and of opportunities already realized, in the way of outside help to the schools through activities in the fields of health, recreation, art, training for work, and training for citizenship and for family ties.

PARKER, PHILIP A MORLEY, Assoc. M. Am. Soc. C. E.

The Control of Water as Applied to Irrigation, Power and Town Water Supply Purposes. 1913. 1055 pp. Illustrated. **$5.00**

This volume, based largely upon notes and formulæ accumulated by the author during a long engineering experience, is intended as a manual for technically trained engineers. Little emphasis is placed upon theoretical aspects. The subject of applied hydraulics is treated in a helpful and original way, and a large amount of entirely new material is given.

THE ARTS AND FESTIVALS COMMITTEE OF THE ASSOCIATION OF NEIGHBORHOOD WORKERS.

A Guide and Index to Plays, Festivals and Masques for Use in Schools, Clubs and Neighborhood Centers. 1913. 44 pp. **27 cents**

KAISER, JOHN BOYNTON, B. L. S.

Law, Legislative and Municipal Reference Libraries. 1914. 467 pp. **$4.00**

"An introductory manual and bibliographical guide," of value to librarians, students, investigators, legislators and others. Fuller treatment is accorded to materials and methods of legislative and municipal reference work than to those of law libraries.

NETTLEFOLD, J. S.

Practical Town Planning. London. 1914. 493 pp. Diagrams. **60 cents**

In explaining "how to set about the preparation of a town planning scheme, what should be done and what should be avoided," the author is guided by the principle that economic incentive in the right direction is far more valuable than rules and regulations. The main discussion is followed by valuable appendices which throw light upon the technical phases of the problem in hand.

ELIOT, CHARLES W., Editor.

Charles Eliot, Landscape Architect. 1914. 770 pp. Many photographs and plans. 2 maps. Bound in 1 vol., **$3.79**; bound in 2 vols., **$4.33.**

A reissue of a valuable book which will be especially welcomed by students and practitioners of landscape art and by persons interested in the creation or management of fine public or private estates, large or small.

HAYWARD, WALTER B., Editor.

The Commuter's Garden. 1914. 219 pp. 16 photographs. **$1.07**

An enjoyable book for the city man or woman who has moved to the suburbs and who requires information in order to take advantage of the garden opportunities thus offered.

ELIOT, CHARLES W.,
STOREY, MOORFIELD,
BRANDEIS, LOUIS D.,
RODENBECK, ADOLPH J., and
POUND, ROSCOE.

Preliminary Report on Efficiency in the Administration of Justice. (Prepared for The National Economic League.) 1914. 32 pp. **Free**

DAVIES, A. M., and
MELVILLE, C. H.

A Handbook of Hygiene. (Fourth edition, revised and enlarged, of "A Handbook of Hygiene," by A. M. Davies.) London. 1913. 718 pp. 6½ by 4 inches. Illustrated. **$2.74**

In handy, portable form, a mine of authoritative information on the following subjects: Air and Ventilation; Water and Water Supply; Food and Dieting; The Removal and Disposal of Sewage; Clothing; Habitations; Personal Hygiene; Soils and Sites; Climate and Meteorology; The Causation and Prevention of Disease; Disinfection.

THE CIVIC PRESS.

The American City Pamphlets. The following pamphlets have been issued during the last month:

The Modern Park Cemetery. By Hare & Hare, Landscape Architects, Kansas City, Mo. No. 116. 15 cents.

Rose Valley—A Garden Suburb (near Philadelphia). No. 118. 10 cents.

CITY OF MANCHESTER (ENGLAND) TRAMWAYS DEPARTMENT.

The Passenger Transportation Problem. (Report of the Special Sub-Committee.) 1914. 141 pp. Many photographs, maps and plans. **$1.36**

One-half of the report consists of general observations on the passenger transportation problem in New York, Philadelphia, Boston, Chicago, Pittsburgh, Newark, Toronto, Montreal, Paris, Berlin, Vienna, Hamburg, London and Glasgow. The remaining pages deal with the lessons to be derived and with their special application to the city of Manchester.

BOARD OF EDUCATION, CITY OF NEW YORK.

School Savings Banks. (Document No. 6—1914.) 10 pp. **Free**

Report of a Special Committee on School Savings Banks. Contains the committee's suggestions as to rules and regulations for organizing and conducting school savings banks in the public schools of New York.

COMMONWEALTH OF MASSACHUSETTS.

Law and Regulations Governing the Construction and Maintenance of Garages, and the Storage and Handling of Volatile Inflammable Liquid in Connection Therewith. 25 pp. **Free**

The law went into effect May 15, 1914, except Section 26, Chapter 4, which took effect October 1, 1914.

On the Next Bridge You Build

Take a little thought about an ornamental lighting system. Consider how attractive such a system would be. Would it not beautify the surroundings and increase the civic pride in your town?

Install Cutter Lamp Posts

for two reasons—First, we have for the past twenty-five years manufactured boulevard, park and bridge lighting systems. We know how. Secondly, our large variety of designs gives you the opportunity of selecting one which will be distinctive to your locality.

We plan and arrange for White Ways. Why not let us know your requirements? Let us suggest some ideas without cost to you. Write for Bulletin AC-3210.

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("Admitted to be the best Fibre Conduit.")

Made with four styles of joints: Socket, sleeve, screw and "Harrington," with bends and fittings for same.

Is the Lightest Conduit Made

(3" socket joint 1.2 lbs. per foot.)

hence the freight and cartage charges are reduced to the minimum.

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Pierson-Roeding Co.
San Francisco, Cal.
Seattle, Wash.
Portland, Ore.
Los Angeles, Cal.
Salt Lake City, Utah

Bryant Zinc Co., Chicago, Ill.

METROPOLITAN SEWERAGE COMMISSION OF NEW YORK.

Main Drainage and Sewage Disposal Works Proposed for New York City; Reports of Experts and Data Relating to the Harbor. (Report of the Metropolitan Sewerage Commission of New York.) April 30, 1914. Quarto. 762 pp. Maps and diagrams. (Supply limited.) **Free**

AMERICAN WATER WORKS ASSOCIATION.

Report of Committee on Tabulation of Water Rates and Other Information of Interest to Water Companies. (Reprinted from *Journal of the American Water Works Association*, Vol. I, No. 2, June, 1914.) 337 pp. **25 cents**

This valuable tabulation represents nearly a year's work. Among its interesting features is the section showing water rates under municipal and under private ownership.

Methods, Materials and Appliances

News from Engineers, Manufacturers and Supply Houses, of Interest to Municipal and County Officials and Contractors for Public Work

Evidence as to Pavements

Several million yards of Trinidad and Bermudez sheet asphalt pavements that have given a service of twenty years or more, are illustrated and described in a booklet entitled "Evidence," just published by The Barber Asphalt Paving Company. A score of cities are represented, and wherever maintenance data were obtainable this information has been given, with the date on which the pavement was laid and a photograph showing its present condition. The oldest of the pavements so described is the Trinidad sheet asphalt pavement on Vermont avenue, Washington, D. C., which is 35 years old. Something more than 1,000,000 square yards of asphalt paving in Washington, D. C., averaging 23 years of age, has cost 1.8 cents per yard per year for maintenance. New Orleans has several 30-year-old pavements; Buffalo has 1,200,800 yards of sheet asphalt 20 years of age or more and still in use. Among other cities that contribute to the census of more-than-20-year-old pavements are New York, Philadelphia, Boston, Chicago, St. Louis, Cincinnati, Columbus, Detroit, Omaha, Charleston, S. C., Savannah and Louisville.

✣ ✣

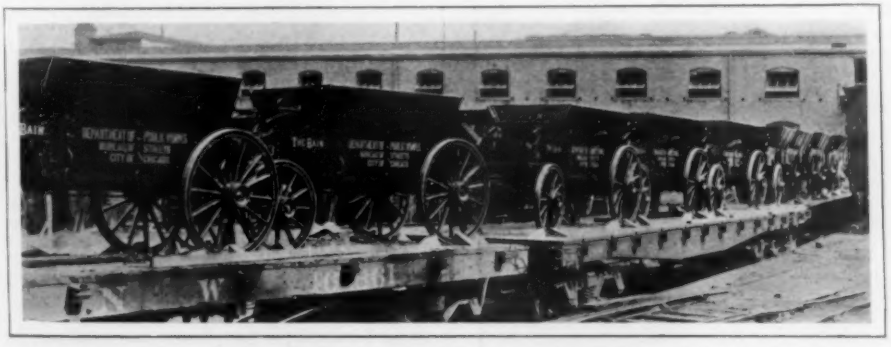
Asphalt Wagons for Chicago

The picture below shows part of the shipment of twenty 3-yard asphalt wagons manufactured by the Bain Wagon Company, of Kenosha, Wis., and purchased this year by the Chicago municipal asphalt plant. An article about this asphalt plant will be found on page 212 of the September, 1914, issue of THE AMERICAN CITY.

✣ ✣

A Gun for Works of Peace

"The Cement-Gun" is the title of a valuable monograph, recently issued by the Cement-Gun Company, of 30 Chestnut street, New York. It contains many handsome illustrations, indicating the wide variety of uses to which the Cement-Gun method of applying mortars, con-



A SHIPMENT OF WAGONS FOR THE CHICAGO MUNICIPAL ASPHALT PLANT

Reinforced Concrete Lighting Standards

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Business and Residence Streets Parks Estates Public Buildings

Manufactured and Installed By

Morrison & Quinn, Inc.

311 Cutler Building
Rochester, N. Y.

Bale Waste Paper —then sell it

Waste paper in public buildings can be turned into money. It is a trouble and expense now, but with the

ALL STEEL Schick FIREPROOF

The Government Approves of It

Paper Baler you can get full value for it.

We are in close touch with Paper Stock dealers in constant need of waste paper, and would be able to place you in communication with an easy market.

As long as you delay learning more about the Schick, just so long will you be ignorant of the money in waste paper. Write us to-day for more details.

The Davenport Mfg. Co.
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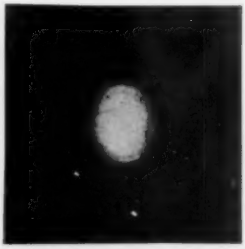
LIGHT UP

BUT DO IT

THE RIGHT WAY

THE appearance of ornamental lighting is often ruined by the use of the wrong kind of glassware. Ordinary glass balls, which in the daytime carry out the symmetry of an ornamental column—at night become ridiculously small splotches of light, *like this*



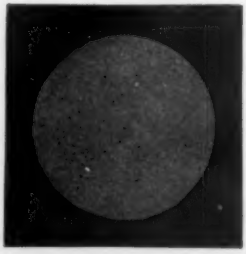
USE POLYCASE GLASS

REGISTERED

and you will have

UNIFORMLY LUMINOUS BALLS OF LIGHT

Like this



When **POLYCASE** balls are used the glass itself becomes the source of light, owing to the remarkable diffusing qualities of this glassware. In addition **POLYCASE** absorbs very little light.

GLEASON-TIEBOUT GLASS CO.

New York City San Francisco Chicago

cretes or stucco may be put. These include the repairing of a masonry dam and sea walls, sealing up the face of a rock cut, protecting structural steel, coating wooden piles, covering frame buildings with stucco, and other uses. The pamphlet also illustrates and describes the company's apparatus and the methods by which the cementitious materials are mixed and applied.

An Effective Street Sign

A neat style of street sign is seen in the accompanying photograph, which illustrates a combination lighting standard and sign post. This is one of many porcelain enameled iron signs—street, advertising, motor license, exit, no smoking and others, in various colors—shown in a 24-page catalogue issued by the Royal Enameling & Manufacturing Company, of 326 West Madison street, Chicago. The sign has the advantage of being attachable to any size of wood or iron post, either square or round. Its height, over all, is 30 inches; width 17 inches. The bracket is heavily galvanized, and a galvanized protecting clamp insures rigidity and lengthens the life of the sign, which is said to be particularly well adapted to standing extreme climatic conditions.

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Securing Correct Water Meter Service

A new bulletin of 18 pages, issued by the Buffalo Meter Company, of Buffalo, N. Y., is called "Setting, Repairing and Testing Water Meters," and explains the customary practice attending the use of water meters. It is based upon the proper conception of a water meter as an instrument of precision that needs correct installation, occasional cleaning and skillful repairing. The size of meter to use, its location, rules for setting and starting and sealing, are dealt with. The duties of meter readers are outlined, and instructions for repairing disc meters are given. It is recommended that the history of each meter be kept by a card index system. To facilitate the ordering of parts of the American and New Niagara meters made by this company, the part numbers and names are listed and pictured. Directions for testing meters are given, and tables are included showing how to correct meters by changing gears.

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A Test in British Columbia

The Daily Colonist, of Victoria, B. C., gives in its issue of September 12, 1914, the following account of the testing of the city's new motor hose wagon, shown on page 308 of this issue:

"The official test of the new motor hose wagon, just arrived from the plant of the Nott Fire Engine Works, of Minneapolis, was held yesterday afternoon, when the machine, with a full service load, was given a 15-mile spin, and made to negotiate all the steep hills inside the city. The test was in every respect satisfactory, both as to speed and power. On one speed run the apparatus easily made 55 miles an hour, and the ease with which it pulled its load up the steepest hills gave indication of its great power. In addition to a load of 2,800 feet of fire hose, the machine bore the fire wardens, Aldermen Bell, Fullerton and McMicking, with Chief Davis and two or three others. The weight of the machine when loaded was nearly 6 tons."

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A War Benefit

Large orders have recently been received by The Ludlow Valve Company, of Troy, N. Y., from the British Admiralty for high-pressure valves, which are to be installed in the new warships which are now being built for the British navy. These and other large orders received from various corporations and concerns throughout the British Isles since Great Britain engaged in the present war will keep the Ludlow works busy for some time to come, and the shipments abroad will represent many tons. The war has resulted in the closing of many valve works in England, and the British Admiralty and business concerns in Great Britain have been forced to place their orders outside their own country. Mr. James H. Caldwell, the president of the company, is

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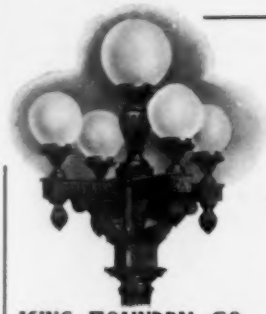

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quoted as saying that up to a year or two ago the British Admiralty had, from time to time, placed orders for Ludlow valves, but none so large as the one just given, and the same is true, to some extent, as regards the orders from private concerns.

For the Protection of Concrete Edges

The Kahn curb bars, recently placed on the market by the Trussed Concrete Steel Company, of Youngstown, Ohio, are made from a special section of high-grade, open hearth steel which is punched and expanded by powerful machinery. It is claimed that the steel plate is of ample size to take all shocks and distribute them throughout the mass of concrete; that there is positive anchorage, the anchors from the same section as the plate extending well into the concrete, and the positive shoulder giving absolute anchorage independent of the adhesion of the concrete. The bars are easy to handle and install, without special tools or equipment. They are heavily galvanized after forming, and are furnished curved to any reasonable radius to meet the requirements of street intersections. The standard lengths are 8, 10 and 12 feet. They are used not only for street curbs but for concrete columns, walls, platforms, stairs, bridges, buildings, etc. This and other products of the same company are described and pictured in an 8-page pamphlet sent free upon request.

Fire Apparatus for a California City

Shipment has just been made by James Boyd & Bros., Inc., Philadelphia, of one triple combination, 700-gallon pump to the city of Covina, Cal. This is one of the Boyd Company's type PB cars, with a six-cylinder, 5¾-inch x 6½-inch motor.

The machine was put through a number of severe tests before leaving the factory, and made a remarkable showing. Under underwriters' conditions, from a 15-foot lift, the machine pumped 780 gallons.

This will be one of the handsomest pieces of apparatus on the Pacific Coast, being painted pure white, with gold striping. It is equipped with pneumatic tires, and has a steel hose body, the capacity of which is 1,200 feet of fire hose.

Meeting a Big Demand

The rapidly-increasing business of the Star Electric Company, formerly of Binghamton, N. Y., has made more commodious quarters necessary, and the company has found a new home in Newark, N. J. For some time the capacity of the Binghamton factory had been severely taxed to meet the demand for the newer types of Star fire and police apparatus. An official of the company states that, on top of a 300 per cent increase this year, the company's success in securing the contract to equip the entire Panama Exposition with Star fire and police apparatus proved an unexpected advertising stimulus. Confronted with the alternatives of immediately tripling the capacity at Binghamton or building a new factory where conditions were better suited to the growth and development of the business, the officials decided that the latter course was best.

NEW PLANT OF THE STAR ELECTRIC CO.

The new factory which the company now occupies is one of the finest of its kind in the world, with over four times the capacity and floor space of the old plant at Binghamton. The general offices, aside from the New York offices, and the Western department, which is still in charge of Frank C. Stover, Chicago, are located in this new building.

An Efficiency Record

On page 306 of this issue is shown a photograph of hose wagon No. 1, which has been used by the fire department of South Bend, Ind., for twenty-two months, and is said to have developed 100 per cent efficiency in that time. This piece of apparatus is made by the South Bend Motor Car Works.

Paving Work

The *Utica Daily Press* makes reference to the recent closing of a contract for paving work in Rome, N. Y., to be done by Warren Bros. Company, of Boston:

"The Warren Bros. Company, through their representative, C. E. Kennedy, has closed a contract with the Rome Brass & Copper Company for paving Bouck street with their bitulithic pavement, on concrete base, from East Dominick street to the Central Railroad industrial tracks, formerly the main line. The pavement is to be 26 feet in width between the curbing. The curbing is to be the best grade of Medina sandstone.

"This company has the heaviest trucking of any manufacturing interest in the city, with the possible exception of the Merchant Iron Mill, and the fact that it has let the contract to the Warren Bros. Company for the paving speaks well for the wearing qualities of this pavement. The Rome Brass & Copper Company is also interested in several of the industries which line the south side of Railroad street, where the manufacturing interests also paved that street at their own expense, the city at large not being called upon to pay anything toward the paving of these two streets. The manufacturing interests did this in order to get what they wanted in the paving line, knowing from experience from the miles of this paving

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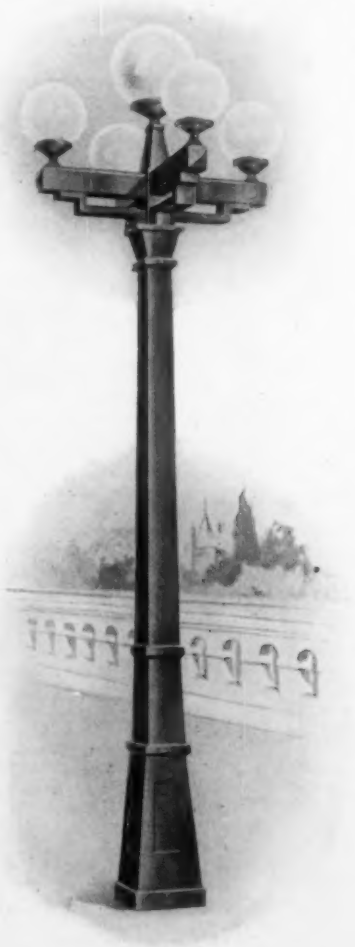

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in the city that it is the most satisfactory that can be laid for any purpose. The paving of Bouck street is to be completed this fall, according to the contract. The Warren Bros. have completed three-quarters of a mile of paving in Mill street this season, and are now paving North and South James street, connecting links, John, Jay, Spring and River streets."

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Exhibitions of Water Main Cleaning

Among the entertainment features provided at the recent convention of the New England Water Works Association were demonstrations of water main cleaning done for the city of Boston by the National Water Main Cleaning Company, of New York. The first section of the work was done on Conant street, near Huntington avenue, Roxbury, when the cleaning of 700 feet of 6-inch water pipe was witnessed with interest by about 80 members of the association. A second exhibition was also successfully carried out.

At both ends of the pipe to be cleaned openings were made in the ground and into the pipe. A cable was passed through the line of pipe by means of a special carrier device, and the cleaning machine, having been attached to the end of the cable, was drawn through the pipe by the aid of a windlass. During this process water was allowed to flow through the pipe in the direction in which the machine moved, carrying the debris ahead and out through a riser pipe to the surface of the ground. All the incrustation and dirt were effectually removed, leaving a full and free flow of water.

Inspecting Brick Pavement

Inspection trips over brick pavements occupied two days of the convention of the National Paving Brick Manufacturers' Association, held last month at Buffalo, N. Y. The purpose of these trips was the study of brick pavement construction on country highways, and about eighty cars carried members and guests over an interesting route to a number of the surrounding places, among them Niagara Falls, Lewiston, Youngstown and Old Fort Niagara. The photograph here reproduced shows members of the party noting the condition of the brick in the pavement on Lake Shore Drive made ready for rolling.

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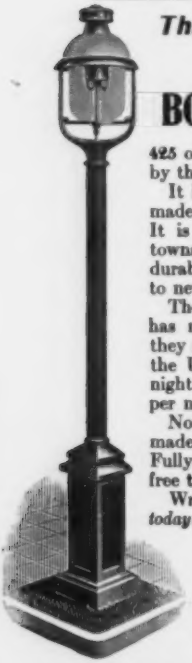
Expansion Joints in Brick Pavements

Among the exhibitors at the recent convention of the National Paving Brick Manufacturers Association was The Waring-Underwood Company, Inc., of Philadelphia, which is the manufacturer of the Ideal Expansion Joint, claimed to be the original pre-molded asphalt expansion joint. Samples of the different sizes manufactured were exhibited, and interesting literature regarding the product was distributed. In the inspection trips made by the delegates and guests this joint was frequently seen on the brick roads which are being constructed under the supervision of the New York State Department of Highways. The company's New York State representative, Mr. Edward H. Goodrich, was present during the entire convention.

BRICK PAVEMENT ON LAKE SHORE DRIVE, BUFFALO, UNDER INSPECTION



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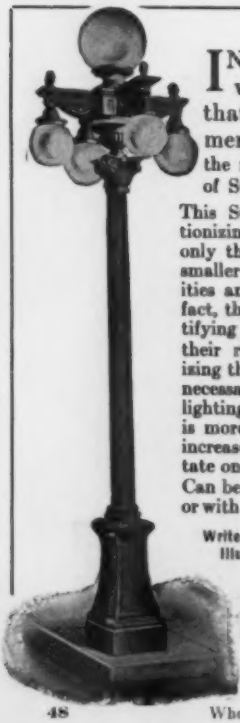

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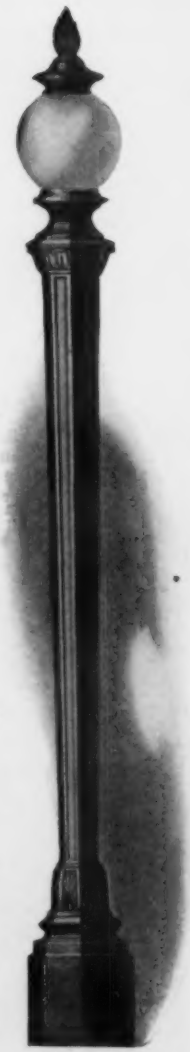

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